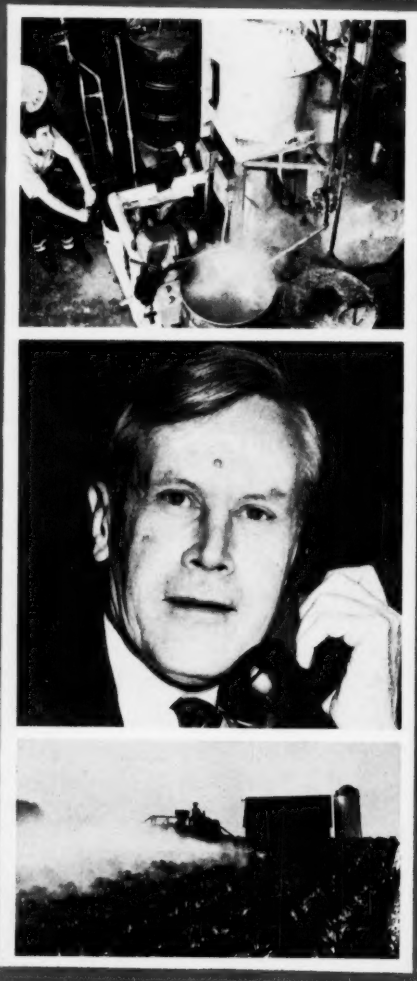
Chemical Week

February 2, 1952 Price 35 cents



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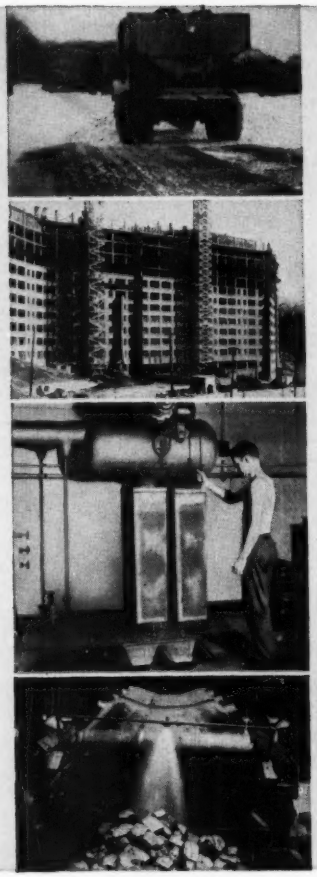

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Chemical Week

Volume 70 Number 5

February 2, 1952

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OPINION . . . . .

Polyol Uptrend

To The Editor: Congratulations on the informative article "Polyols in Flux" (Jan. 12).

It is interesting to note that total sales of polyols have doubled within the past eight years, and the trend continues. With glycerine output likely to remain fairly steady, as you say, the newer polyols . . . can be expected to take up most of the slack, which justifies the quadrupling of sorbitol availability and the 50% increase in pentaerythritol capacity. We agree with you that controlling factors in the polyol market now are "selling price, inherent suitability for use, and degree of promotion." . . .

Sydney Steele
Manager, Market Research Division
Atlas Powder Co.
Wilmington, Del.

Get Rid of Gypsum

To The Editor: The Newsletter in your September 15th issue mentioned a process for making ammonium sulfate by reacting ammonia with calcium carbonate and then treating the resulting ammonium carbonate with calcium sulfate slurry.

It occurs to me that this process could be tied in very advantageously with the Scholler process, as modified by the Forest Products Laboratory, for hydrolyzing wood wastes to sugar. This process calls for neutralizing the dilute sulfuric acid hydrolyzate with lime, filtering off the calcium sulfate and evaporating the dilute sugar solution to molasses.

One of the troublesome features of this process is the disposal of the gypsum cake by-product. But by combining this process with the ammonium sulfate process, as indicated in the following diagram, the disposal problem is eliminated. The calcium sulfate is converted into calcium carbonate in step 4, which is then converted into calcium hydrate in step 3, which in turn is used to neutralize the acid in step 2, thereby regenerating the calcium sulfate. The raw materials are wood chips, sulfuric acid and ammonia; . . . the products are molasses and ammonium sulfate, with no troublesome by-products.

I recognize that this suggested combination of steps is probably not feasible now on account of the shortage of sulfuric acid, but with normal supplies available, what is wrong with it?

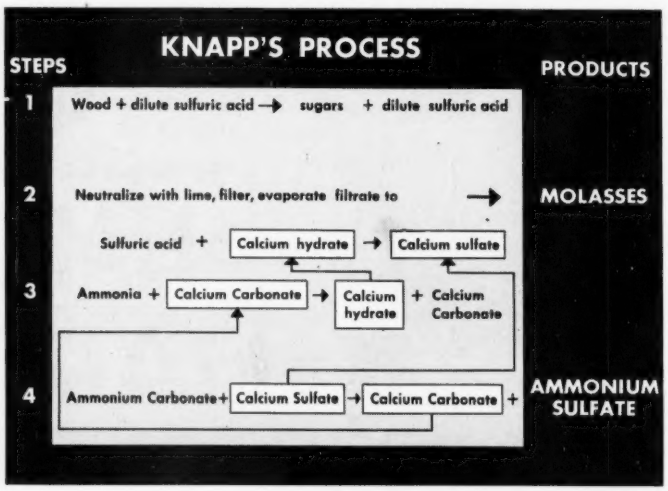
I. E. Knapp
Technical Director
Southern Naval Stores Division
Leach Brothers, Inc.
Columbia, Miss.

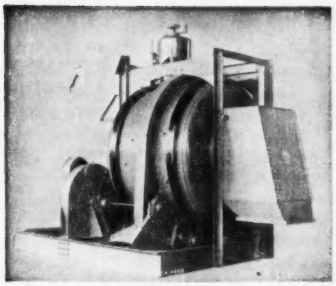
A good question, Reader Knapp. What do you say, other readers?—Ed.

Cyclone Booster

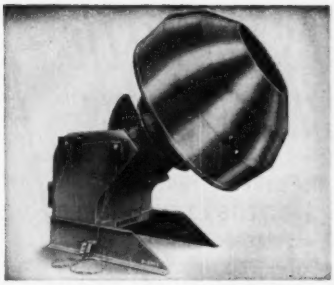
To The Editor: You may be interested in knowing (article on liquid cyclones, Dec. 15 issue) that liquid cyclones have been in wide use in the paper trade for around fifteen years, and are standard equipment . . . widely used for separating as well as recovery applications. Principal use is dirt removal. . . .

Units are selective in their operation; they can remove particles having specific gravities quite close together. . . . They also can be arranged

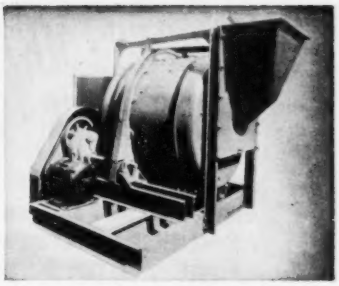




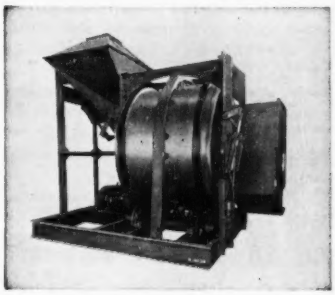
CHEMICALS—Equipped with liquid measuring tank for use in various chemical applications.



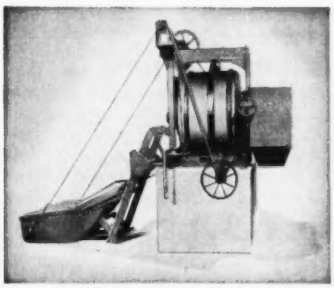
CHEMICALS • DRUGS • PLASTICS METALS • FOOD • CANDY—Pan is tilted and rotated by motors. Capacities up to 3090 lb.



COMPOSITION MATERIALS • INSULATING AND REFRACTORY CHEMICALS • CLAY • GLASS BATCHES • FOUNDRY CORE SAND—13 cu ft dry mixer on skids.



ENAMEL FRITS • GLASS—50 cu ft dustproof mixer. Fully-automatic, electrically controlled charging and discharging.



FURNACE CHARGES • GLASS BATCHES—28 cu ft mixer with elevating power loader.

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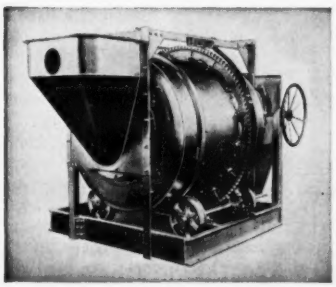
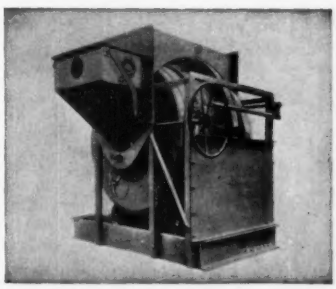
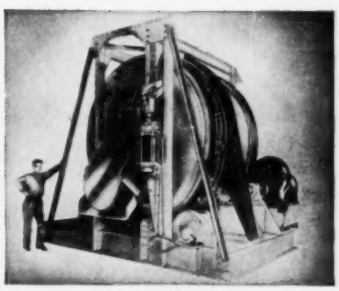


SOAP POWDER • PIPE TOBACCO • SNUFF—Dustproof mixer for blending and mixing.



FERTILIZER—Standard sizes, ½, 1, 2-ton capacity. Also used for asbestos products, etc.



FURNACE CHARGES—One of the largest industrial mixers—batch capacity of 260 cu ft.

OPINION . . . . . .

to separate particles having similar densities, but different settling rates because of different particle shapes.

They are especially engineered for each application. Their chief advantages arise from considerations such as their continuous operating, self-cleaning and servicing features, as well as low space requirements and moderate cost. From an efficiency viewpoint . . . it is difficult to see how they can compete with an equally well engineered continuous mechanical centrifuge. . . .

Operationally the use of an outside pumping system to provide high rotary acceleration seems less efficient than the built-in rotor. Seldom do sufficiently high pressure flow conditions exist to permit use of a separator without a special pump. Pump friction losses are added to the cyclone losses in separated units, whereas the internally powered units should be more efficient—other things being equal.

However, maintenance considerations carry so much weight that the maintenance engineer often prefers a standard pump with which he is familiar.

. . . As with air cyclones, more angular acceleration is obtained by using batteries of small units instead of larger units. Also, the more angular acceleration, the more power consumed and pressure drop across the unit. The real advantages of liquid cyclones will probably become more apparent as we grasp the basic functions involved and realize the flexibility of such units.

Properly designed and arranged, they can make simple continuous counter-current immiscible liquid scrubbers or adsorption units. Suitable arrangements make possible an immiscible liquid reactor where the unreacted components and products are separated and recycled. Heat-jacketed units can be made into good endothermic dissolvers.

By means of a variation it is even possible to make a wet spinning and twisting unit for forming a coarse twine from water dispersions of long fiber.

We have hardly touched the surface of this tool—the liquid cyclone, so don't let anyone undersell it. . . .

Rexford H. Bradt
Consulting Chemist
Warsaw, Indiana

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 36, N. Y.

HOW TO HELP BRITAIN ...and Ourselves

The purpose of this editorial is to help Winston Churchill obtain the aid Britain needs

(1) to weather her present financial crisis, and

(2) to avoid a chronic recurrence of such crises.

This is not a philanthropic purpose.

Britain is our staunchest ally in the free world's continuing fight for survival. She cannot perform her role effectively if she is broke, or if she careens from one financial crisis to another.

Then, too, a nation such as ours—committed to private enterprise as a way of economic life—has a special interest in helping Winston Churchill to help Britain. His administration is relatively friendly toward private enterprise. Should he fail, he would be replaced promptly by a Socialist government more hostile than ever. And that would weaken the standing of private enterprise in the free world.

Cause of the Crisis

It is the drive of the Western World under our leadership to rearm against Russian aggression that has precipitated Britain's financial crisis. It set off a scramble for raw materials from which armaments could be made, and for many other materials that might be short in the event of war. So the prices of the things that Britain must import—mostly raw materials—have been boosted more than the prices of things she can export—mostly finished products. That leaves Britain short of funds to pay for essential imports. This difficulty increases as the necessity becomes more urgent to divert industrial effort from production for export to production for security.

The Basic Trouble

Although Britain's immediate crisis was touched off by the rearmament drive of the Western World, her basic affliction is one from which she has suffered since the end of World War II. Stated in its simplest terms, Britain does not produce enough goods to pay her own way as one of the family of free nations.

For years this deficiency in home production was made up by income from shipping and overseas investment. But Britain had to sell a large part of her foreign investments to finance her heroic part in World War II. So her income from that source has been greatly reduced. And, in spite of an increase of about a third above prewar in her own production of goods and—thanks to a continued "austerity" program—a much larger increase in her exports, Britain still is not paying her own way.

Two Ways to Solvency

Britain has two ways to restore her solvency. One is to cut down on what is consumed—the belt-tightening process. The other is to step up British production.

To surmount the present crisis, Mr. Churchill has asked for some cutting down. He probably must ask for more.

Except as a stop-gap expedient, however, more cutting down of Britain's consumption is clearly a dangerous course. That would further depress a British standard of living which, not more than half as high as ours, already is too low. Politically such a course would grease the skids for Winston Churchill's administration, even now governing by a wafer-thin parliamentary margin. Also, as *The* (London) *Economist* remarks, the "lazy expedient of cutting trade" would result in "hurting other people and forcing them to take similar action"—by cutting the market for their products.

The Only Cure

The best and, in fact, the only way to help cure Britain's economic ills is to help Britain produce more. Here the technical possibilities are encouraging. On the average, the British industrial worker produces only about 40 percent as much a year as the American worker. That is a British estimate, made by Sir Ewart Smith.

Wider use of better industrial methods and modern tools and an infusion of the competitive incentive into British industry — to replace the cartel and other restrictive practices — would go a long way to narrow this wide gap in worker productivity. This is the consensus of experts on both sides of the Atlantic.

Since 1948 the Anglo-American Council on Productivity has done much to encourage output per man-hour in Britain and to foster this doctrine with both labor and management. But much yet remains to be done.

In the United States it is increasingly suggested that before we give Britain any more economic aid we should insist that everything possible be done to exploit the technical possibilities of increased production. This emphasis on production is needed. But if we Americans were to impose upon the hard-pressed British people conditions that could be construed as an affront to a friendly and sovereign nation, we might well put into the hands of a masterful rabble-rouser such as Aneurin Bevan, the anti-American leader of the Labor Party's left wing, a campaign issue on which to maneuver himself into the Prime Ministership.

Churchill Can Insist

But Winston Churchill is not so handicapped as we should be in imposing prerequisites of further aid. As Britain's own, most honored leader he will raise no touchy questions as to Anglo-American relations if he insists that Britain have firm plans to cure her economic ills, plans sharply focussed on ways and means of increasing Britain's industrial efficiency.

By presenting a convincing plan to cure Britain's recurring crises through greater production, Mr. Churchill will greatly facilitate the process of getting the aid his country must have. He will also remove an increasingly dangerous element of dissension in Anglo-American relations—the feeling of many Americans that more aid to Britain is more money down the drain. The way to counter that feeling is to come up with a prescription for an economic cure, not a request for another economic poultice.

Technically, such a program is entirely feasible. It will perhaps be the supreme test of Winston Churchill's statesmanship to make it politically feasible as well.

In the interest of Britain, of the United States and of the whole free world, we wish him all success.

McGraw-Hill Publishing Company, Inc.

NEWSLETTER

Here's the lowdown on the chemical industry's progress and plans, as revealed this week by McGraw-Hill's annual survey:

Capital expenditures last year were $1,266 million; this year's plans call for an increase to $1,464 million.

You may think that the industry would have been "all set" after the current short-term boom; but preliminary long-range plans belie that notion: McGraw-Hill's survey shows that an additional $1,323 million, $1,191 million and $1,179 million will be invested in 1953, 1954 and 1955, respectively.

New capital means new capacity. Chemical production capacity (Dec. 1950 = 100) was 110 last December, will be 122 this year. Reason for the fast rise: The chemical industry puts a higher proportion (77%) of its dollars into expansion than all manufacturing (53%).

Other industries modernize their old plants; chemical firms junk theirs. That's the obvious interpretation of the relative proportions (47% and 23%) spent on modernization.

Finding the money is harder for the chemical industry, however, than for other manufacturing categories. A growth industry, it is especially hard hit by excess profits taxes, must resort to stock issues and debt capital because it lacks sufficient profits and reserves.

During the 1953-55 triennium, for example, 85% of the manufacturers expect to finance capital outlays entirely from profits and reserves; 9% expect to borrow; 6% plan to sell stock. But in the chemical segment the respective figures are 56%, 19% and 25%.

The survey also showed—as is indeed obvious to those in the industry—that chemical firms spend more than most on facilities for new products—and embodying new processes.

Highlighting that propensity is Dow Corning's go-ahead with a $13 million expansion program for silicone materials. DPA has issued certificates of necessity and construction is now under way. The program won't be entirely completed until 1954.

This is the third and largest expansion since the company built its first plant for the then-novel products in 1944, will quadruple present capacity. In the interim silicones have ceased to be novel, have become tonnage commodities.

The primary certificate—for $10,194,000—was just issued, covers new capacity for basic silicone fluids and resins. Earlier certificates: $560,000 for metallic silicon; $820,000 for methyl chloride; $1,460,000 for Silastic silicone rubber.

The search for titanium is reopening a deposit, near Ste. Agathe, Que., abandoned 40 years ago. Arnora Sulphur Mining Corp. engineers now test-drilling at the site hope to prove a million tons of ore.

Lawmakers, both state and national, shaped the news this week:

The Delaney Committee, back in Washington after its cosmetics-centered New York appearance (CW, Jan. 19), is now hearing witnesses on foods again. Chief items on the agenda: carcinogenic effects of additives, diethyl stilbestrol in poultry.

But later this month the Committee will explore some virgin territory: public health aspects of water fluoridation. Two or three sessions are tentatively planned for taking testimony on the subject.

Reason for the Committee's concern is the increase in fluoridation. The number of communities employing it more than doubled during 1951—from 70 (mostly in Wisconsin) to 169 at year's end, U. S. Public Health Service Officials told CHEMICAL WEEK. Almost three out of a hundred Americans now drink treated water; total number: 4,148,972.

Trial is expected in March or April on a suit filed by pipeline companies to set aside the natural gas gathering tax passed by the Texas legislature last summer (CW, June 16, '51).

It went into effect September 1, and many firms paid under protest (CW, Nov. 3, '51), laying the basis for the present court test.

Whatever the verdict, it is likely to be appealed all the way to the U.S. Supreme Court. If the tax is thrown out, the companies that paid under protest will get refunds; those that paid quietly will have to wait for an appropriation by the state legislature.

The Atomic Energy Commission will have to security-check its personnel without a lie-detector's aid (CW, Dec. 29, '51) if Senator Wayne Morse (R., Ore.) has his way.

Morse is arranging a conference this month with AEC officials. If use of the polygraph can't be stopped voluntarily, he'll sponsor legislation to halt the practice throughout the Government.

Pharmaceutical laboratories and rabid antivivisectionists are locking horns in New York over a bill introduced into the state legislature. The bill, sponsored by the State Society for Medical research, would allow unwanted dogs and cats to be utilized for research.

Wall Street is buzzing with rumors that Olin Industries is planning expansion into petrochemicals—but they're very premature.

Basis for the rumors, most likely, is Olin's recent acquisition of Frost Lumber Industries (CW, Dec. 29, '51) whose extensive land holdings contain some oil and gas reserves.

Olin says any "plans" are only in discussion stage, concedes that "of course, we're always looking for expansion possibilities that tie in with our present holdings."

More phenol from cumene? That seems like a likely process bet for Monsanto's new plant adjacent to Tide Water Associated Oil's refinery at Avon, Calif. The multimillion-dollar plant will be started this year, completed by early 1954.

Inflation note: OPS's amendment this week to CPR-22 will allow manufacturers of cobalt chemicals to pass along 90% of the recent 30¢-a-pound increase in the price of imported cobalt. Chief among the affected products: paint driers and animal feed supplements.

. . . The Editors

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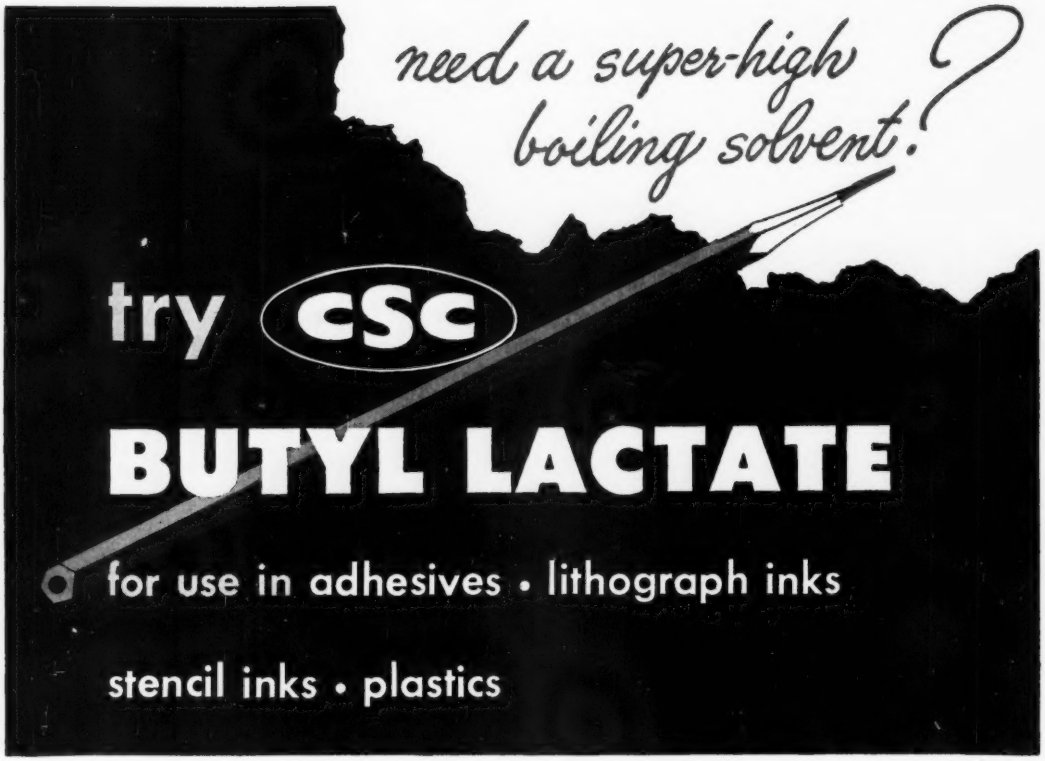

BUTYL LACTATE is useful in these and other products largely because of its unusually powerful solvent action and slow rate of evaporation. In adhesives it serves as a temporary plasticizer, improving the strength of the bond and insuring good adhesion to coated surfaces and many plastics. Inks containing butyl lactate are characterized by their "bite" on plastic surfaces. As a "fugitive" plasticizer it facilitates drawing or shaping plastic sheets and articles.

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Purity, ester by weight, minimum:	95%
Specific Gravity at 20°C/20°C:	0.974-0.984
25°C/25°C:	0.970-0.980
Acidity as lactic acid, maximum:	0.15%
Water (naphtha test):	None
Non-volatile matter, maximum:	0.01 g/100 ml
Color:	Water-white
Distillation Range:	
Below 140°C:	None
Between 155°C and 195°C, minimum:	90%
Between 187°C and 189°C, minimum:	60%
Above 200°C:	None

Physical Properties

Formula:	$CH_3CHOHCOOC_4H_9$
Molecular Weight:	146.18
Boiling Point at 760 mm Hg:	188°C
Vapor Pressure at 20°C:	0.4 mm Hg
Melting Point:	−43°C
Coefficient of Expansion, per 1°F:	0.00055
Weight per U. S. Gallon at 68°F:	8.15 lbs.
Flash Point, Tag Open Cup:	168°F
Refractive Index, n_D at 20°C:	1.4216
Surface Tension at 20°C:	30.6 dynes/cm
Solubility in water at 25°C:	3.5% by volume
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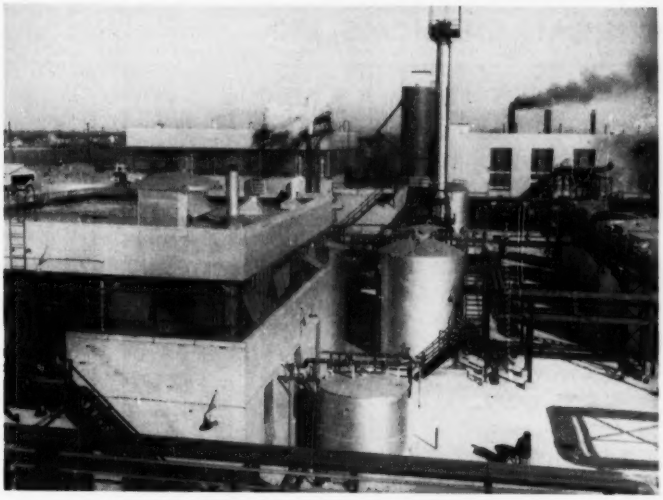


FATTY ACID PRODUCTION: A search for new markets.

Sitting Down Together

Producers of fatty acids, spurred by a specter of oversupply, last week held their first full-scale meeting, becoming the fatty acid division of the soap and glycerine producers association.

Need for joint development work—to do what individual producers can't accomplish—was stressed as the key to expanding markets, continuing profits.

Almost as spiritual as the Hatfield McCoy feud has been the competition between producers of fatty acids. To them, the shading of a stearic acid quotation is to be remembered, even unto the third and fourth generation.

But in New York last week, rivalry was laid aside as fatty acid manufacturers sat down together. Under discussion was a mutual problem—the need for finding new markets.

It was, for the most part, overexpansion of the industry for the then-available outlets back in January, 1951, which sparked this meeting. First seeds of organization were sown a year ago when some fatty acid producers—in New York for the soap association meeting—batted around the idea of founding their own trade group. Formal establishment came in March, 1951.

For an eleven-month-old group, working in a definitely competitive industry, it has much to be proud of:

- Snipping the umbilical cord from the soap association's glycerine division. The fatty acid group is, itself, an autonomous division of the soap group.
- Establishing a statistical section, which reports each month on over-all production, sales and stocks of eleven different types of fatty acid.
- Discussing a possible cooperative research program—to do, jointly, what individual producers have been unable to do alone: developing new uses for fatty acids.

But for the 80-odd representatives of fatty acid producers who gathered in the mirrored and chandeliered Janssen Salon at the Waldorf, the total effect was more than a sum of these parts.

Serious Problems: The problems which the fatty acid industry face are serious: Surface-active agents not based on animal or vegetable fats have appreciably cut into their market potential. Sale and price of fatty acid by-product glycerine have been depressed by competition from synthetic glycerine, pentaerythritol and sorbitol (*CW, Jan. 12*). Considerable expansion in capacity has taken place, with a few short-term gluts.

Remedy Search: To allay any long term dislocations, producers asked experts from four major fatty acid-consuming industries to discuss the product trends likely to affect fatty acid usage.

Manufacturers did not expect any miraculous cure-alls. If they had, they would have been disappointed. The consuming cognoscenti did, however, give a pretty definite indication that fatty acid producers will have to standardize their products.

As Bristol-Myers' Louis B. Dobie put it: "One man's stearic should be the same as another's. A difference in iodine value or in the stearic-palmitic ratio is critical for some products."

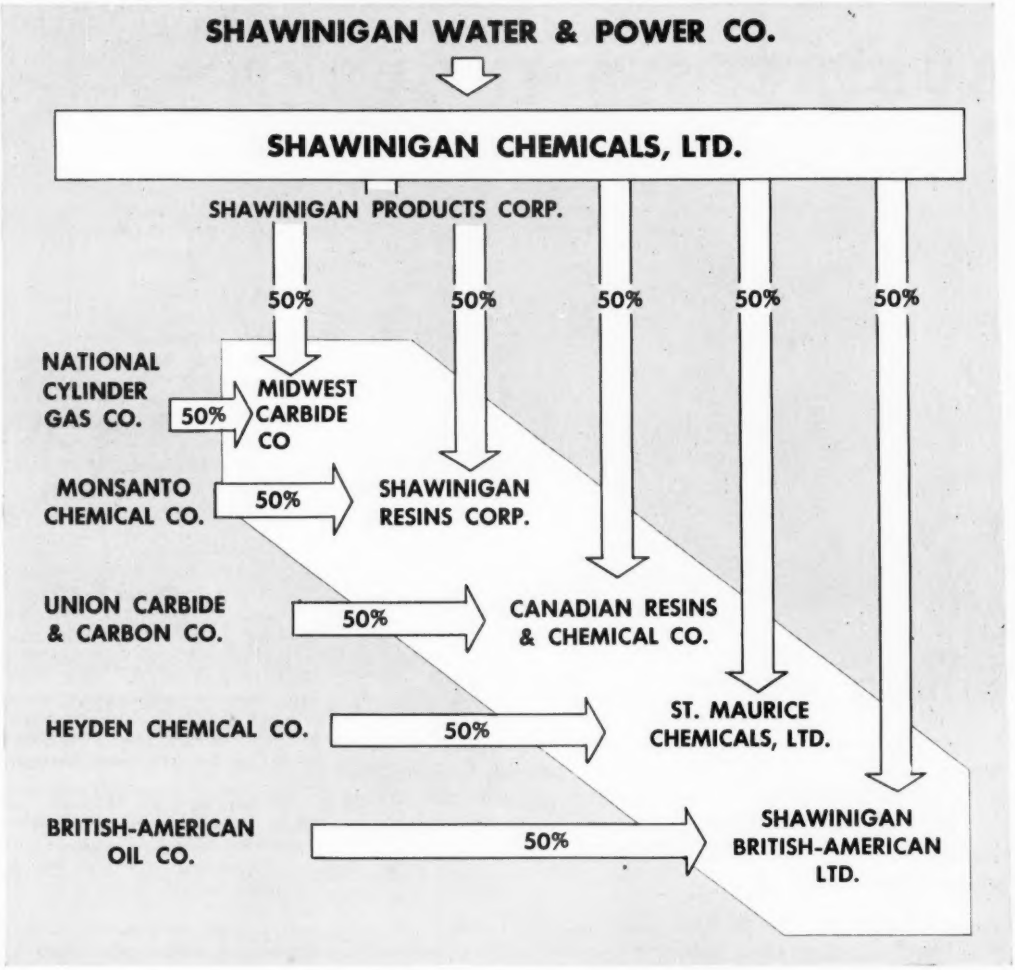
Speaking only for use in toiletries, Dobie pointed out that while manufacturers don't expect it, the producer of a new fatty acid mixture or derivative who has conducted clinical tests on it "has his foot inside the sales door."

For fatty acid use in paints and resins, Cyanamid's Henry Enterline saw a trend toward performance rather than strictly chemical testing. Cyanamid, he said, prefers to test the color qualities of a fatty acid by actually making a resin sample and then observing its color—rather than by examining the color previous to use.

Present outlook for use in the rubber industry is an expansion proportional to increased rubber usage, except for black GR-S synthetic, where rosin acid soap is proving a better solubilizing agent for zinc oxide.

Use of fatty acids or fatty acid soaps in lubricating oils and greases is on the decline. T. G. Roehner of Socony-Vacuum did see, however, a definite future expansion in the use, in cold temperature lubricants, of dicarboxylic esters, which are derived from animal and vegetable sources.

The division's retiring chairman—Swift VP E. A. Moss—summed up: "It seems to me that we have the chassis of our organization well built, the engine in working order, the truck body in place, but we have not yet loaded into it some of our most serious problems."



Chemicals for Chemicals' Sake

St. Maurice Chemicals, Ltd., is the name that has been given to the latest joint venture of 49-years-young and still vigorous Shawinigan Chemicals, Ltd. Its partner in this venture will be Heyden Chemical Co. The products: formaldehyde and pentaerythritol.

This is important news. But the implications of this move and a previous step—formation of Shawinigan-British-American, Ltd. for manufacture of phenol via cumene hydroperoxide—are of even greater importance. For the first time Shawinigan Chemicals has stepped out of its strait-jacket and started the manufacture of chemicals for chemicals' sake. Previously, although progress had been rapid and profits good, all ventures were in the field of calcium carbide and acetylene, or in areas where large quantities of the cheap power from the chemical company's parent, Shawinigan Water & Power Co., could be used.

Heretofore the parent was interested only in the manufacture of chemicals to provide an outlet for the huge blocks of cheap hydroelectric power available from its development of the hydroelectric resources of Canada's St. Maurice River. But some ventures were entered into in the United States to exploit the know-how gained in manufactures based on this electric power.

Catalyst: It might be said that cheap electric power was the catalyst for the formation of profitable joint ventures by Shawinigan and other companies. Those in the United States are held by the chemical company's subsidiary, Shawinigan Products Corp. This company owns a half interest, with National Cylinder Gas Co., in Midwest Carbide Co. at Keokuk, Iowa, and a half interest with Monsanto Chemical Co., in Shawinigan Resins Corp. at Springfield, Mass. The first company manufactures calcium carbide from the hydroelectric power furnished by the huge Keokuk Dam across the Mississippi River, while the resin company is producing a line of vinyl polymers. At present a unit for manufacture of polyvinyl al-

cohol and one for production of polyvinyl acetate emulsions is under construction at the Springfield plant.

Shawinigan participated in one other major venture in the United States: It was one of the three companies (Du Pont and Union Carbide were the other two) that formed Niacet Chemicals in the mid-20's for production of acetaldehyde and acetic acid from acetylene. Union Carbide is the surviving partner, and Niacet is now operated as a division of Union Carbide's Carbide & Carbon Chemicals Co. Division.

In Canada: In addition to St. Maurice Chemicals and Shawinigan-British American Shawinigan owns a half interest in Canadian Resins & Chemicals Ltd., with the Bakelite Div. of Union Carbide. The plant is located at Shawinigan Falls, Que. The resins company at present is installing a new $1 million calender for better manufacture of vinyl resins.

But Shawinigan Water & Power Co. does not have a direct capital interest in all of the chemical ventures that its low-cost electric power has spawned. Besides a "passel" of paper mills, where Shawinigan's power is so cheap that the boilers for steam-raising are heated with electricity, power is supplied for an aluminum reduction works (Aluminum Co. of Canada, Ltd.), and a caustic-chlorine plant (Canadian Chemical Industries, Ltd.).

Shawinigan Power also supplies the power to fuel the electric smelters of Quebec Iron & Titanium Corp. at Sorel, Que. One furnace is now operating but three more are well along and plans are being made for the installation of four more units. Quebec Iron is one of the largest mineral developments of many a moon and represents a total capital expenditure by all parties of the order of $100 million. In addition, power is supplied to the now-building elemental phosphorus plant of Electric Reduction Co., which has a plant site adjacent to that of St. Maurice Chemicals near Varennes, Que.

Exports Down: The chemical company was for years one of the largest exporters of chemical products in the entire world. This is no longer true. Comparative figures for 1939 and 1950 are

Country	*1939*	*1950*
Canada	49.0%	64.0%
United States	8.0%	22.0%
Other Exports	43.0%	14.0%

And this reduction in exports is not due to a reduction in Shawinigan Chemical's production. Rather, it is due to a growth in the home market. Thus the company is no longer subject to the whims and fancies of international trade for profit. Canada has grown to the extent that a steady domestic demand has taken over.

Further, the chemical company is expected to keep on expanding—possibly at an even higher rate than that of the parent company. Earnings on chemicals were up in 1951, while those of the power company were down. The company's total income was $5.3 million for 1950, including a dividend of $1.4 million from the chemical company—net income for chemicals was $2.27 million. Thus it is not improper to say that the primary job of Shawinigan Power is production of chemicals, either by furnishing industrial power to other manufacturers or to itself for chemical production. In addition, the two new companies, St. Maurice Chemicals and Shawinigan-British American, should increase this dependence on chemical manufacture for the company's profits.

"Real" Wages

The problem of accurately computing the actual income of workers is of major importance to businessmen who have to deal with the demands of organized labor. The rapid growth of "fringe benefits," or non-wage income, has made the task more difficult and provided much more room for figures to vary at the bargaining table.

Recently, George C. Smith, of the U.S. Chamber of Commerce's Committee on Business Statistics, discussed the subject at a statisicians meeting. According to Dr. Smith, the Chamber's survey shows that this non-wage income averaged about 23¢ an hour in 1948, and has increased steadily since.

With this in mind, Smith claims, it becomes apparent that most currently published statistics, which purport to measure worker's incomes, actually understate the rises in recent years. The figures are based only on wages paid; however, companies are paying considerably higher in "fringe benefits."

Little has been done to develop a method for taking these items into account, according to Smith. What has to be done is to find a way to redefine wages in terms of the total return to an employee, or replace the term "real wages" with "real income." The many new methods of non-wage payments must be explored and data collected on them regularly.

In any event, it has become obvious,

Celebrating Stockholder

ON-THE-FLOOR WORKINGS of the New York stock exchange are shown to Mrs. Roma N. Hawkins, Phillips Petroleum's 66,000th stockholder, by Sidney Rheinstein, floor specialist in Phillips stock. More modest celebration plans were extended to a week-long fête, including visits to Bartlesville, Okla., Borger, Tex., and New York, when the company discovered: (1) that Mrs. Hawkins—MacMurray College Dean of Women—had so vivacious and charming a personality and (2) that she bought the stock on her 66th birthday.

said Smith, that wage supplements have reached such a size that any attempt to measure real wages without them is going to be grossly inaccurate, and that the size and variety of such supplements are increasing rapidly. At present, however, no Government agency is collecting current data on these items.

Hercules Hedges

A favorite device of chemical companies these days is the use of debt capital to erect producing plants. Not so with Hercules Powder Co. According to Hercules Pres. C. A. Higgins, the company is hedging against inflation by concentrating on expenditures which will result in an increased capital turnover. At present the company is realizing about $2 in gross sales per $1 invested—up very appreciably from prewar results.

This situation provides a tip on new capital expenditures. The company is putting into projects that provide for modernization and integration of plant facilities, a far larger percentage of its capital outlay than other chemical producers. Out of a total expenditure of $15 million in 1951 (up $6 million from 1950) only $4½ million was for increased ouput of such products as toxaphene, carboxymethyl cellulose and cellulose acetate. The rest was for cost reduction via technological advance and better plant integration. Example: Manufacture of chlorine from by-product hydrogen chloride at its Brunswick, Ga. plant (*CW, Jan. 19*).

New capital expenditures for 1952 are expected to reach about $18 million, according to Higgins. Of this about 37% is expected to go into plants to manufacture new products or to expand the plant capacity for existing products; 17% will be spent to improve the raw materials position of Hercules; 21% for cost reduction; and the rest will be utilized for miscellaneous purposes.

Same for Research: A similar situation prevails for the $5½ million which Hercules spent on research in 1951. Only 35% was on totally new products. This is not to say that the company does not come up with its share of new products: Latest and most dramatic in a long series is the production of phenol and *p*-cresol from cumene and *p*-cymene respectively (*CW, Aug. 25*).

To manufacture these materials (as well as cymene alcohols, for use as flotation reagents, and acetone), Hercules will build a plant at a New Jersey location. The company will manufacture its own cumene from benzene and propylene, the benzene presumably to be supplied by U.S. Steel's new Fairless Works. There are a number of possible propylene sources —any one of the number of petroleum refineries that abound in the Paulsboro-South Philadelphia-Marcus Hook area.

Capacity will be about 15 million pounds per year of phenol; 5 million pounds of *p*-cresol; 5 million pounds of cymene alcohol flotation reagents; 12 million pounds per year of acetone. Hercules should be able to put this acetone to good use in its acetic anhydride plant at Parlin, N. J.

The new plant will be quite flexible in that either *p*-cresol or phenol can be manufactured in essentially the same equipment, and production

C. A. HIGGINS: Makes Hercules' dollars work harder.

can be tailored to fit the market demands. Although costs differ widely from place to place, Hercules' experts think that on a phenol basis and at today's prices, the new process will be about two cents per pound less expensive.

Others Too: Although not so spectacularly, other divisions of the company continue to grow. Long static, the demand for industrial explosives, Hercules' first major product, has started on a new growth cycle. Reason: Increased use of low-concentration ore bodies requires more explosive per pound of product. Further, the use of open pit-mined coal is fast expanding—it now accounts for about a quarter of the total—and this method requires about four times as much dynamite per ton as shaft-mined coal.

The sales of the other two major categories, cellulosic derivatives and naval stores, have also continued forward. Hercules' most interesting naval stores development is its pilot plant at Klamath Falls, Ore., where the company is studying the economics of producing naval stores from ponderosa pine stumps. Higgins states that success or failure of this project should be decided in about a year. Success will open up a large new source of raw material to replace the relatively depleted supply of Southern pine stumps.

No more than 20%: Higgins emphasized that no more than 20% of the company's output is taken by any one industry, and that no one product accounts for more than 15% of sales. Also, the export market for Hercules' products was a healthy $25½ million in 1951.

The sales breakdown by categories is:

Explosives	less than 20%
Cellulose products	about 40%
Naval stores	about 40%

Clear Sailing: Without any indebtedness, and with a continuing cost reduction program together with the new products provided in the company's new phenol plant, Hercules sees clear sailing ahead, no matter how rough the economic weather may become.

Adhesive Fracas

Latest development in the legal squabble between Reichhold Chemicals, Inc., and the American-Marietta Chemical Co. was last week's "show cause" hearing before the U.S. Circuit Court of Appeals, San Francisco. Reichhold got a writ of certiori to determine whether Robert Schroedel, production supervior of its Northwest division, must answer questions, as American-Marietta wants, about the chemical formulation of its glue. The court is now considering the petition and is not expected to hand down an opinion for some 30 days.

Involved Fight: This is only the most recent round in the involved battle between the two adhesive manufacturing companies. American-Marietta filed suit in Seattle, Wash., seeking $2½ million from Reichhold for alleged patent infringement and unfair competition in the misappropriation of trade secrets. Reichhold countered with an $11 million cross-complaint against American-Marietta for unfair competition in financing exclusive sales agreements with purchasers of plywood glues.

The trouble grew from a joint agreement made in 1942 between Reichhold and Adhesive Products

NONISOLS

The NONISOLS are nonionic surface-active fatty acid esters of higher polyglycols, all substantially 100% active oils or soft waxes, light in color and bland in odor. Free fatty acid content is maintained at less than 3% and ash content less than 0.1%.

	NONISOL 100	NONISOL 110	NONISOL 200	NONISOL 210	NONISOL 300	NONISOL 250
Solidification temp	3°C	6°C	−8°C	−10°C	30°C	32°C
Solubility: water	S	D	D	D	D	S
xylene	S	S	S	S	S	S
kerosene	I	D	I	S	S*	I

S-soluble **D**-dispersible **I**-insoluble ***S**-soluble above m. pt.

The NONISOLS all possess comparatively low melting points, high boiling points and low vapor pressure. They are all either soluble or readily dispersible in cold water, sometimes forming viscous, thixotropic mixtures; they are characteristically insoluble in hot water. Solubility in the presence of dissolved electrolyte is good. The NONISOLS are all soluble in polar and semi-polar solvents with the exception of glycerine and the glycols; solubility in aliphatic hydrocarbons varies inversely with water solubility.

Aqueous solutions of the NONISOLS are very slightly acid (pH 5.8-6.7); they are stable in the pH range 3.5-9.5, but will hydrolyze in strong acid or alkali. The NONISOLS have good stability to heating or autoclaving. Being nonionic, they are compatible with either anionic or cationic materials.

As a group, the NONISOLS may be classified as excellent interfacial tension depressants, spreading agents, emulsifiers, lubricants and skin detergents; they are fair surface-tension depressants and penetrants but poor or indifferent foamers. The group includes dispersants, wetting agents, thickeners, solubilizers, rewetting agents. Animal feeding tests indicate the NONISOLS are relatively nontoxic.

Suggested Applications

COSMETICS, PHARMACEUTICALS: ointments, hair dressings, hair conditioners (300); solubilizer for lipstick dyes, essential oils, perfumes, vitamins, sterols, flavors (250); opacifier for cold wave (100); hair shellacs, lotions, protective creams, deodorants, skin detergents, calomine, suppositories (300); polish remover (100,200).

TEXTILES: rewetting agent for sanforizing, wool dyeing, acetate dye dispersant (100); coning oil for nylon and other fibers to prevent graphite penetration (110); lubricants, wool oil additive; starch paste stabilizer and textile softener (300).

METALS: rust preventative oils, emulsion cleaners, solvent cleaners (200, 210); wire drawing, ash free greases (300); cutting oils (250,210); buffing compounds.

PAPER: rewetting agent and softener for towelling, tissues (100); stabilizer and plasticizer for starch sizing (300).

ALRODYNES

Nonionic Emulsifiers for Agricultural Sprays

	ALRODYNE 315	ALRODYNE G	ALRODYNE 97
Mol. Wt.	3150	900	1050
Solid. T°	7°C	14°	11°
Viscosity (25°C)	1700	100	500cps

The ALRODYNES are nonionic polymeric emulsifiers, relatively non-toxic to animals, non-injurious to plants; ALRODYNES G and 97 are strongly aphicidal. They are suitable for formulating emulsifiable concentrates of DDT, methoxychlor, Chlordane, lindane, Toxaphene, benzenehexachloride, Parathion, 2,4-D and 2,4,5-T esters, Aldrin, etc., in aromatic or aliphatic solvents.

The concentrates are stable on storage, mix readily with soft or hard water to produce non-foaming emulsions, quick or slow breaking as desired, compatible with metal salt sprays.

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Corp. (which was later bought by American-Marietta) to develop a waterproof glue. The agreement was dissolved within a few years, and the present suits are essentially over who owns the rights to the information developed under the agreement.

Whose? Main bone of contention appears to be the ownership of the weatherproof, waterproof phenol-aldehyde resin adhesive developed under the agreement between Reichhold and Adhesive Products. The resin was developed by Donald V. Redfern, then chief chemist of Adhesive Products and now technical director of American-Marietta. Reichhold manufactured it and Adhesive Products sold it, and Reichhold claims they agreed to equal rights in the product and any future patent. When their agreement ended in 1944, each company made and sold its own glue.

Adhesive Products was purchased by American-Marietta in 1946 and Redfern went with the deal as technical director. The process was patented in 1948, and last March Redfern filed for reissue of the patent. Now American-Marietta alleges Reichhold has violated the patent, and is manufacturing and selling the glue as its own. Reichhold contends, on the other hand, that it has changed the formulation of its resin glue.

Price War: American-Marietta also charges that Reichhold cut prices below cost on its no-clamp soybean adhesive to force American-Marietta out of that field. Reichhold denies this.

At present the litigants are awaiting the outcome of Reichhold's show cause petition before anything further can be done.

Outside Money

Higher tax rates, increasing costs and rapid growth are changing the pattern of chemical financing for many companies: Traditional depreciation reserves and retained earnings no longer supply sufficient capital for current huge expansions; sale of stocks and bonds is the answer.

Evidence of the trend is found in the amount of capital raised during the past year by a representative group of companies—19 (including subsidiaries) of the 39 in the portfolio of the Chemical Fund, Inc.

A total of over $942 million was arranged for through new security issues, sold privately to large institutional investors or publicly to private investors. Of this, some $665 million (about 70%) was in the form of debt capital, while over $276 million (about 30%) was risk capital raised by sale of common or preferred stock. Much of the preferred stock and some of the debt capital are convertible to common stock. Some $121 million of this new money was used to retire old issues, and to cover the expense of the financing operation, leaving $821 million for expansion programs or working capital.

Not all of this necessarily reflects immediate expansion plans, for the capital involved in many of the debt issues need not be taken for a number of years—generally five. Interest rates for keeping this money "on hand" are low, and such interest is deductible for tax purposes.

But expansion programs already undertaken have depleted the reserves of many companies to the point where sufficient capital is not available for all contemplated expansion. And the larger the program, the greater the need for working capital.

Triple Squeeze: Rising costs of construction and labor continually up expansion cost estimates, and prices of manufactured products are not always able to reflect fully increases in prices of raw materials.

The chemical industry is not alone in suffering from these effects of inflation, of course. However, as a growth industry, it has perhaps been penalized far more than the average by last year's revenue act. Because current sales and profits from tremendously expanded capacity are far above those of the base period for calculating excess profits taxes, most companies pay the maximum 70% of earnings under corporate income and excess profits tax laws. This leaves little for continued growth.

As the figures for these 19 companies indicate, many chemical producers have become substantial borrowers of money.

FINANCING IN 1951*

COMPANY	ISSUES OF EQUITY SECURITIES GROSS PROCEEDS	ISSUES OF EQUITY SECURITIES NET PROCEEDS†	BONDS GROSS PROCEEDS	BONDS NET PROCEEDS‡
Abbott Labs	$ 10,365,000	10,365,000		
Celanese	100,000,000	39,029,000	$ 49,165,000	29,415,000
Central Soya			10,000,000	6,704,000
Commercial Solvents			25,000,000	25,000,000
Dewey & Almy	4,425,000	3,304,000		
" "	1,240,000	1,240,000		
Dow Chemical	11,500,000	11,500,000	90,000,000	90,000,000
" "			50,000,000	50,000,000
Hooker Electrochemical			11,000,000	7,400,000
Marathon			7,000,000	7,000,000
Mathieson	17,519,000	12,519,000	6,000,000	6,000,000
Mathieson-Alabama			8,000,000	8,000,000
Merck	25,428,000	25,428,000		
Monsanto			66,000,000	66,000,000
Natl. Distillers	50,000,000	23,000,000		
Norwich Pharmacal			2,000,000	1,250,000
Chas. Pfizer	15,225,000	15,225,000		
" "	14,652,000	14,652,000		
Pittsburgh Plate Glass			11,750,000	11,750,000
Southern Alkali			10,750,000	10,750,000
Spencer Chemical	6,250,000	6,250,000	5,100,000	5,100,000
Squibb	15,375,000	15,375,000		
Union Carbide			300,000,000	300,000,000
Victor Chemical	5,000,000	5,000,000	4,000,000	4,000,000
Total	$276,979,000	$182,887,000	$665,765,000	$638,369,000

Total Gross from Stocks and Bonds: $942,744,000

Total Net from Stocks and Bonds: $821,256,000

* By 19 chemical companies (including subsidiaries) of the 39 in the portfolio of the Chemical Fund.

† After refunding existing issue, commission and expenses.

‡ After refunding existing issue.

Ammonia "Fix"

The Best Fertilizer Co., Texas, has accused the San Jacinto Chemical Co. of trying to force it to take part in a "deal" that would mean paying what amounts to black market prices for anhydrous ammonia.

The fertilizer company has filed a petition in federal district court asking for a court order requiring the chemical company to continue supplying the ammonia for another year under the terms of the contract entered into in 1950.

Alternatively, Best Fertilizer is asking $1,210,000 in damages, $960,000 profits it claims it will lose in 1952, and 200,000 for loss of good will re-

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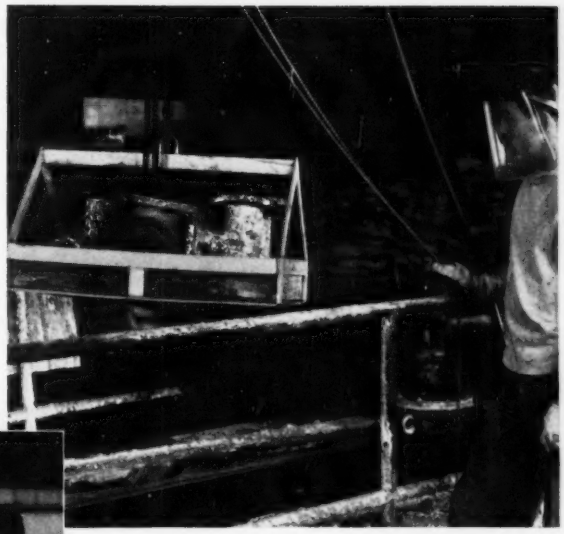
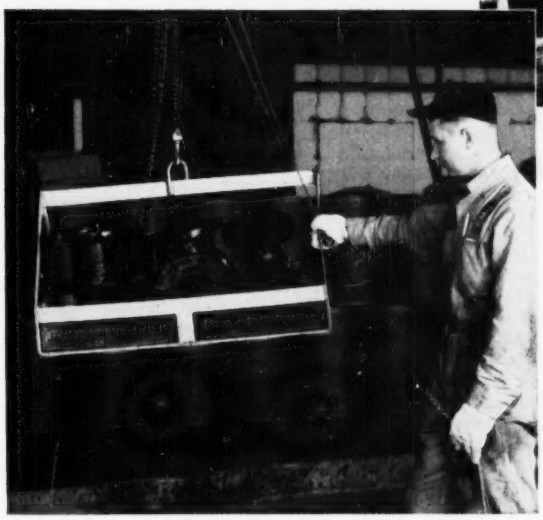


Steel fittings before Virgo Molten Cleaner Treatment



Same fittings after final rinse

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You can salvage thousands of dollars' worth of used chemical equipment quickly and at low cost, with Virgo Molten Cleaner. It removes paint, dirt, rust and chemical impurities—gives you a clean surface in 10 to 15 minutes. No hand scraping, brushing, tumbling or sand-blasting are needed.

Virgo Molten Cleaner may be used on any metal not seriously affected by molten caustic. The process is simple and inexpensive. Here are its main steps:

1. Dip in Virgo Molten Cleaner Bath at 850° F—5 to 15 minutes.
2. Water quench.
3. Acid dip—2 to 3 minutes.
4. Water rinse.

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Paint	Enamel	Chemicals
Dirt	Glass	

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sulting from inability to fill its contracts.

No Raise, No Ammonia: The fertilizer company says that San Jacinto Chemical notified it on Dec. 15 that it would stop supplying anhydrous ammonia to Best Fertilizer because it had been prevented by law from revising its prices.

However, the fertilizer company contends that the chemical company has actually not filed any application to revise its prices, and has already accepted increases in the legal ceiling price permitted by OPS. The fertilizer company's petition charges that, shortly before the contract cancellation notice, a proposal was made to the fertilizer company that it split the profits it makes from sale of its finished product with the chemical company. This, says the petition, is a "subterfuge," to get around the ceiling price.

Shortage: Faced with the present shortage of anhydrous ammonia, the fertilizer company claims it has not been able to purchase enough to maintain its operations at anywhere near capacity. Further, the company says the fertilizer business is too hazardous to operate without an assured supply of raw material.

According to Best Fertilizer its contract with San Jacinto could not legally be cancelled without 90 days' notice at the end of the contract year.

R. F. Hopkins, vice president in charge of production for San Jacinto's Texas plant, would only say that he was ordered to suspend shipments to Best by the company's home office in Maryland.

LABOR . . . . . .

Atomic Labor: It appears that the end may be in sight to the numerous strikes of construction craft workers at the $500 million gaseous diffusion plant under construction for the Atomic Energy Commission at Paducah, Ky.

The construction contractor and the AFL Building Trades Unions have signed a memorandum agreement providing for orderly handling of grievance disputes without walkouts. As to larger disputes, the unions have expressed their intention to recognize the authority of the Atomic Labor Relations Panel. This means that the eighteen unions will not authorize a strike without first utilizing the peacemaking services of the panel.

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District 50: The District 50 local at Dominion Tar and Chemical Co., Montreal, has won a 12¢ hourly increase, plus eight paid holidays, in a new agreement with the company. The contract also calls for seniority, checkoff, grievance procedure, and other standard items.

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Atlas Powder: Under provisions of a wage-reopening clause, workers of two District 50 locals at Atlas Powder Co.'s Tamaqua and Whitehaven plants have been granted 5¢-an-hour wage increases.

EXPANSION . . . .

Caustic Soda: Construction work on Hooker Electrochemical's new $12 million caustic soda plant is slated to begin immediately near Montague, Oceana County, Mich.

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Uranium: Production is slated by April, 1953, at Anaconda Copper's Grants, N.M., plant, where construction work started this week. Anaconda and the Santa Fe railroad have carried out joint explorations for uranium.

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Nickel: Sherritt Gordon Mines will begin construction in spring or early summer on a new nickel refinery to be built at Fort Saskatchewan, Alberta. The company estimates that the facilities will be able to produce 17 million pounds of refined nickel, 1,500 tons of copper sulfide, 300,000 pounds of refined cobalt and 70,000 tons of ammonium sulfate per year.

Ore concentrates to be used in the plant will be shipped 860 miles from the company's Lynn Lake deposits.

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Bleached Sulfate Pulp: Another new pulp mill for Western Plywood will be constructed at Quesnel, B.C. Estimated production of the $19 million plant is 200 tons of bleached sulfate pulp per day.

Construction of the plant will be tied in with the British Columbia Power Commission's' projected hydroelectric plant at Quesnel. This plant, to cost $15 million, will ultimately produce power equivalent to 150,000 hp.

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Pigments: Production is expected to begin within three months at J. M. Huber's Havre de Grace, Md., pigment plant.

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Ammonia Fertilizer: Oklahoma Fertilizer, a newly organized company, plans immediate construction of a 20,000-ton commercial fertilizer plant at Oklahoma City. Ammonium nitrate and ammonium sulfate will be produced.

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Dehydration Facilities: Contract for N. Y. State Natural Gas Co.'s dehy-

dration plant near Renovo, Pa., has been let to Blaw-Knox. The unit will employ diethylene glycol to remove water vapor from 60 million cubic feet of natural gas per day.

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Alkylate: A new alkylation unit is to be constructed at Pure Oil's Toledo refinery. Estimated cost of the facilities is $2,560,000.

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Aluminum: Annual production of Reynold's Longview, Wash., plant will be expanded from 60 million to 100 million pounds by retooling of present equipment.

The project is being started with the understanding that the supply of interruptible electric power from Bonneville will be firmer two years from now, when the new capacity will be ready.

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Dolomite: Two new dolomite processing plants have been completed in Florida, one by the Florida Dolomite Co., at Sarasota, and the other by the Dixie Lime Products Co., at Lebanon. Combined capacity of the plants is 400,000 tons per year. Products of both companies are sold by Dolomite Products, Inc., of Ocala.

COMPANIES . . .

Hanovia Chemical & Manufacturing: This unit of Engelhard Industries is planning a 150,000 sq. ft. plant at Springfield, N.J., the first of a series which will house all company operations, which now are scattered at different locations in Newark. The company produces ceramic colors and quartz products, including ultraviolet quartz lamps.

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Corning Glass: The company, which has spent about $28 million in the last two years, recently completed arrangements with the John Hancock Company of Boston by which the life insurance firm would purchase $10 million in 3.75% debentures, due in 2002.

•

New York Quinine: This division of S. B. Penick has moved from Brooklyn to a new plant in Newark. The old site is said to have been continuously used for chemical production since Revolutionary War days, when facilities for manufacture of saltpeter and gunpowder were located there.

•

National Research: The corporation's directors have recommended that stockholders authorize increase of capital stock from 125,000 to 600,000 shares. Under the proposed plan, present stockholders will receive two

additional shares of stock for every one they hold. The remaining 225,000 shares will be put on sale to raise new capital for the company's expansion program. This includes construction of a plant at Newton, Mass., for the company's equipment division, and expansion of the activities of its wholly-owned subsidiary, Vacuum Metals Corp.

•

Winthrop-Stearns: Canadian operations of this Sterling Drug subsidiary have been consolidated into a separate corporation, Winthrop-Stearns of Canada, Ltd., with offices and manufacturing plants at Windsor, Ont.

•

Dewey & Almy: Arrangements have been made to borrow $2 million from New York's W. R. Grace & Co., for a five-year period. Interest on the loan will be 3½%, and either Grace or D&A have the option to convert the loan to the chemical company's common stock after a two-year period. If this option were used, Grace would own slightly less than 10% of D&A's stock.

•

Owens-Corning Fiberglas: First public offering of the company's stock will come about Feb. 7, when 630,000 shares will be sold—450,000 by the company itself, and 90,000 shares by each of the company's organizers, Owens-Illinois Glass and the Corning Glass Works. Par value of the stock is $5, but the sale price has not as yet been determined.

•

Merritt-Chapman & Scott: The need for working capital has prompted company stockholders to authorize a $5 million issue of convertible preferred stock. Registration statement has been filed with the SEC.

The company's backlog of construction work was over $89 million at the start of the year, compared to $66 million on Jan. 1, 1951.

•

Pittsburgh Plate Glass: The company has offered to buy outstanding shares of Murphy Paint, Montreal, at a price of $32 (Canadian)* per share. PPG has held a substantial minority interest in the company since 1943. Murphy has 103,200 shares outstanding, which traded during 1951 in a $21-$26 range.

•

B. F. Goodrich: An explosion, thought to have resulted from ignition of escaping gases, caused $50,000 damage to one of the company's chemical di-

* Actually, differentiation between U.S. and Canadian dollars is now unnecessary. Spurred by investment opportunities, the Canadian dollar has slowly been inching towards par from the earlier controlled 10% discount rate; last week, it arrived.

The Vulcan organization in Cincinnati has been serving the process industries over the past half century. In 1952 American industry will be called upon to bolster the country's defenses while meeting a steady load of essential civilian demands. In fulfilling these responsibilities, Vulcan is available with its technically-trained staff and specialized facilities to help solve many difficult processing problems.

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vision plants located in South Akron, near the Ohio Canal. Rubber processing chemicals and synthetic rubber polymers are produced in the plant.

•

M. H. Treadwell: This New York firm has established an electrochemical construction division, taking over the contracts and operations of the Electrochemical Construction Co.

FOREIGN . . . .

Salt: New Zealand's Lake Grassmere will soon be the scene of a solar salt industry—the country's first. To date, a light railway system, a washing plant, and a stacker have been installed. Yield is estimated at from 16 to 33 tons per acre.

•

Aluminum: The Philippine government's Office of Economic Coordination has just turned down a Reynolds Metals Co. bid to set up a $6 million aluminum refining plant at Maria Cristina Falls, site of an ECA-assisted hydroelectric power project. The OEC maintained that nearly all the prospective power output of Maria Cristina had already been mortgaged to other industries, and moreover, there would be little justification for the project since bauxite and other raw materials would have to be imported. However, if the company is willing to foot the entire cost of additional power development at Maria Cristina, the plan may be reconsidered.

•

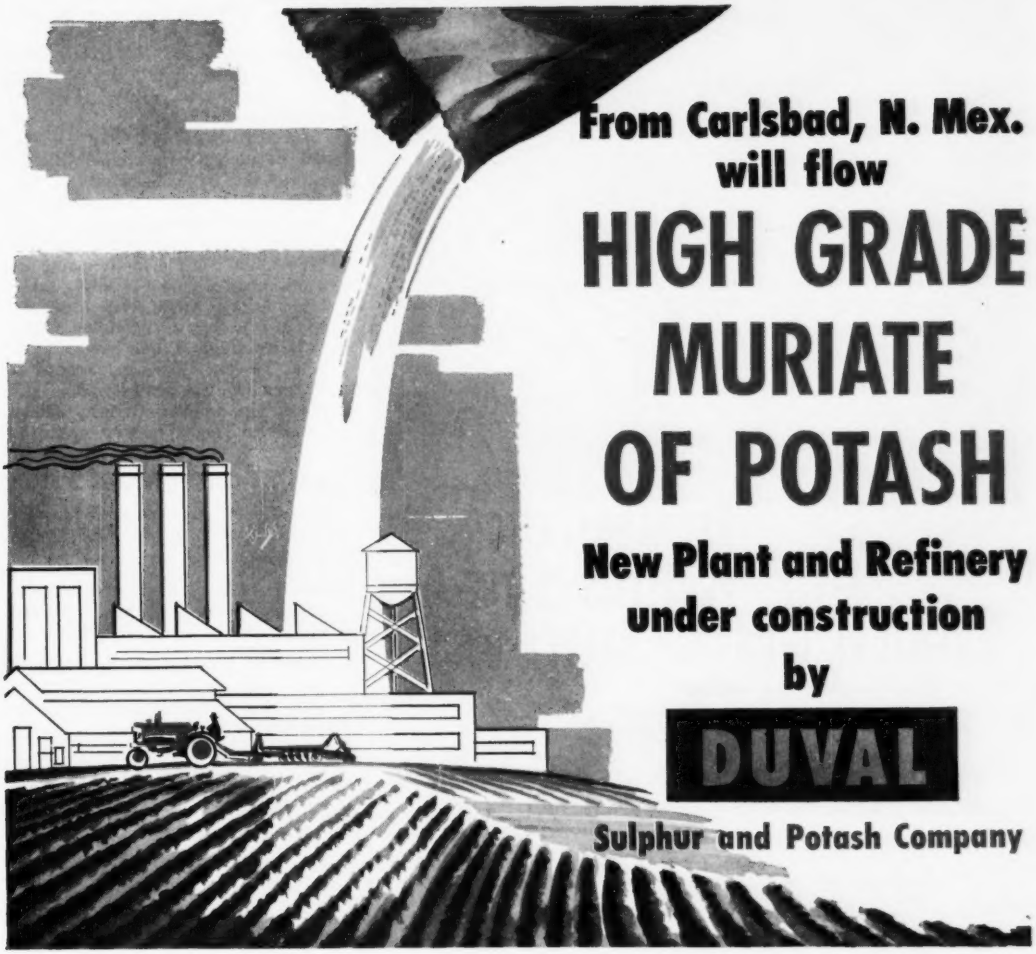
Soap: The Nihon Yushi Co., Tokyo, one of the largest soap makers in the Far East, is planning to install a 50-ton-a-day fat splitting plant. The Blaw-Knox Co. will design the installation and supply the equipment and licensed processes to be used.

•

Sulfur: The Italian government has allotted almost $10.5 million for the modernization of the Sicilian sulfur mining industry. In addition, it has granted the Italian Sulfur Organization $105 million to be used in the search for new deposits. Despite these efforts, total 1952 sulfur production in Italy will probably not exceed 250,000 tons, a relatively small drop in the sulfur shortage bucket.

•

Cellulose: Israel is planning to establish a company for cellulose production patterned along the lines of the new Palestine Potash Co. (*CW, Dec.* 8), i.e., with the government retaining 51% interest. At present its Research Council, investigating the use of local vegetation as a raw material



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source, has found that many low-growing plants in the Negev desert as well as various native straws and weeds are suitable.

●

Oil Refining: Anglo-Iranian Oil Co. is extending its holdings both in Australia and Germany: In Australia, the company is currently completing details for a new refinery to cost $70-$100 million, while in Germany the company has bought the Julius Schindler Oil Co.'s Neuhof refinery where it expects to boost production to some 200,000 tons annually by 1953. To cost in the neighborhood of $2.8 million, the latter operation will jump Anglo-Iranian's German refining volume to 800,000 tons per year.

KEY CHANGES . .

Paul Zinner: From regional director, Region V, to chief, Minerals Division, Bureau of Mines.

Paul T. Allsman: To regional director, Region V, Minerals Division, Bureau of Mines.

David N. Hauseman, Brig. General, Ret.: From Houdry Process Corp. to marketing executive, Davison Chemical Corp.

Robert W. Lawrence: To manager, explosives development, Hercules Powder Co.

J. Delano Hitch: To executive vice president, Dorr Co.

T. Barlow Ford: From manager, international sales, to vice president in charge of sales, Dorr Co.

Wesley C. Ekholm: From superintendent, carbon black production, to general manager, carbon black operations, Columbia Carbon Co.

Robert P. Williams, Jr.: To vice president, Rheem Manufacturing Co.

Clarence Graham, Sr.: To vice president, Rheem Manufacturing Co.

William J. Rothemich: From president, R-B-H dispersions division, to vice president, Interchemical Corp.

James C. Richards, Jr.: From manager, international sales, to vice president in charge of sales, B. F. Goodrich Chemical Co.

William Hirschkind: From research director, western division, to technical adviser to the president, Dow Chemical Co.

L. C. Boos: To vice president and general manager, international division, U. S. Rubber Co.

CONANT (seated, center) AND NATIONAL SCIENCE BOARD: Recultivating for a new harvest.

NSF: Angel of Fundamental Research

The National Science Foundation, guardian of the Federal research purse, is closing out its first year of existence.

Here's the current picture of its accomplishments, philosophy and plans for the future.

On May 10, 1950, the American people—through their elected representatives—brought the National Science Foundation into being to spend the taxpayer's money in the interest of fundamental research. Now, after nine months of life, the Foundation is reporting back to the people.

In accepting its mandate, the Foundation took on a monumental task: Fundamental research has steadily been losing ground over the past several decades to short-term, applied investigations. In the opinion of industry, the situation is critical. R. J. Dearborn, chairman of the Patent Committee of the National Association of Manufacturers, points out that by 1945 industrial research had grown about tenfold since World War I, while basic scientific research had not kept pace.

World War II only helped make a bad situation worse. Not only did it interfere with the normal output of basic research; it also choked off the production of young scientists to carry the ball after hostilities had ceased.

In the words of J. Robert Oppenheimer, wartime director of the Los Alamos Scientific Laboratory, "We learned a lot during the war. But the things we learned are not very important. The real things were learned in 1890 and 1905 and 1920—in every year leading up to the war—and we took this tree with a lot of ripe fruit on it and shook it hard, and out came radar and atomic bombs."

The Foundation's job, then, is recultivating the soil around the roots of the research tree so that it will again yield a bountiful harvest of fruit. Obviously, this is no short-term project; it's going to take time—years until results are apparent. NSF is still in its infancy. It can't show any tangible accomplishments yet, but it does have a good start on the blueprint for revitalizing fundamental research. And in the light of the international weapons race, it may well be a blueprint for survival.

This grand design really boils down to a national research policy to take its place with agricultural, economic, foreign, labor and the other working policies of the government. Here NSF is breaking new ground, is now trying hard to gather the information needed to formulate an intelligent program.

Here are some of the things NSF wants to know:

- What is the total financial support now being provided for scientific research?
- What is the distribution of this support among the three major sources —Government, industry, and educational institutions?
- What amount of financial support can and should be provided and what is the most desirable distribution from among the available sources of support?
- What areas need greater emphasis?
- What means can be developed to shorten the period between discovery and practical application?
- What are the present and future needs for trained scientific manpower?

No up-to-date assessment of the national research situation exists, but NSF isn't completely in the dark. Previous efforts in the field, like the Steelman report (*Science and Public Policy*) of 1947 and the earlier Bush report (*Science—the Endless Frontier*) have proved valuable as cornerstones of the Foundation's study.

More recent information comes from the annual figures of the Bureau of the Budget and the Department of Defense's Research and Development Board. On the whole, the orders of magnitude of the figures supplied by these agencies are in agreement.

Within the limits of the present data, some general conclusions have been reached on the extent of the current national research and development effort:

The nation is spending about $2½ billion a year for all research and development activities; the Federal government supplies between 60% and 70% of the total, industry kicks in with 25% to 35%, the universities about 5%. But regardless of its source, nearly two-thirds of the entire amount actually is spent in industrial facilities.

Since the universities are the major strongholds of basic research, it's

plain that basic research is on the short end of the research dollar. It's going to take financial nourishment to beef up the basic research effort. But NSF finds that research grants have a tendency to concentrate in relatively few institutions.

During the past three fiscal years, for example, eleven schools accounted for about half the money obligated. More and more institutions are getting a share of the wealth, but many are still untapped by Government agencies supporting research.

A comparable situation exists in industry, but here the geographic factor is most striking; the metropolitan areas of New York, Chicago and Philadelphia alone account for more than a third of industrial laboratories and research personnel.

Plan of Attack: NSF proposes to support basic research on as broad a geographic and institutional basis as possible—especially in the small institutions, where a boost may be the difference between first-rate research and a mediocre program usually not worth the effort.

Other constructive measures—for speeding up the dissemination of scientific information, reducing the time lag between discovery and application—are slowly shaping up. But technical manpower today is the biggest and most urgent problem facing NSF.

Consequently, a graduate fellowship program is now the Foundation's first order of business in the belief that more graduate level scientists will have the most immediate beneficial effect on the tight technical manpower situation.

As the Foundation approaches the threshold of its second year, under the able leadership of Alan T. Waterman, its spirit is best exemplified in the words of Member* James B. Conant, ". . . the expenditure of public funds in this enterprise, I feel certain, will prove to have been a most advantageous investment by the American people. . . . Until such time as disarmament becomes a reality, the free nations must be deeply concerned with finding and developing scientific pioneers, for on their efforts we must rely as much for increasing national security in a war-torn decade as for industrial progress in periods of peace."

Translating these well-turned phrases into a dynamic national research policy will be no mean accomplishment—but one that will more than repay the effort.

* President of Harvard University and Chairman of the fund-distributing National Science Board.

Catalysis on Wheels Ups Octane

Catalytic modification of petroleum is no longer a novelty. But do it in the cylinders of an automobile engine, to benefit fuel performance, and you make news.

And news it was when Russian-born Sophia Berkman, catalysis expert of Associated Development and Research Corp., owned up to that very deed, revealed data showing a resultant octane increase and lack of carbon formation.

The Berkman catalyst is a selective group of acidic ores and minerals, bonded into a porous mass and set into the piston or cylinder head of the engine. It's the tangible expression of a pet theory of hers which goes something like this:

SOPHIA BERKMAN: One up on nature.

When crude oil was formed eons ago, it acquired its chemical properties chiefly as a result of the catalytic action of the various earth minerals on buried organic matter. These same minerals should still be able to do their stuff on refined gasoline, control the type and rate of combustion within the engine by altering the chemical nature of the fuel.

Of course, any such quick description doesn't do justice to the fundamental chemistry of the Berkman theory. Needless to say, it's far from simple, encompasses carbonium ion mechanisms, dehydrogenation-oxidation reactions and a basic physicochemical treatment of hydrocarbon reactions.

In practice, this comes down to what Sophia Berkman calls the "selectivity" principle: choosing minerals of exclusive catalytic properties with respect to specific types of combustion reactions as well as with respect to the specific hydrocarbon constituents of the fuel.

Tests of the Berkman catalytic piston in Standard C.F.R. (Cooperative Fuel Research) engines are cited as proof of the validity of the unique theory. Associated Development and Research reports that gasoline rated at 76 octane performed like 100 octane fuel. Moreover, it says carbon deposits, found in the average aircraft engine after running one hour, were lacking in engines equipped with the Berkman catalyst after 40 hours' operation.

Implications of the results reported by Sophia Berkman are clear to the automotive and petroleum industries. If the Berkman process proves its widespread practicability, low-compression engines (with their economy of operation) may yet power the family flivver. And the trend toward progressively higher octane gasolines could also go by the boards.

It's a rosy picture, but don't expect to find the mineral catalyst in this year's new models: It's still a research proposition. Cost, however, won't be an obstacle; Associated Development and Research says raw materials should be less than a dollar for a multi-cylinder engine. Cost to the car buyer would be considerably more, but probably only a small fraction of the total engine cost.

Synthetic Fuels Push

A stepped-up synthetic liquid fuels research program is the significance of Koppers Co., Inc.'s new Fuels Processing Section. The new research arm will continue the company's coal carbonization studies, but gasification and hydrogenation will come in for a greatly increased share of attention.

Koppers isn't a newcomer to the field of liquid fuels by coal gasification, frankly admits that gasoline from coal today couldn't compete with the petroleum product.

But it is just as candid in its belief in the ultimate commercial feasibility of gasification for fuel production. Koppers pins its hopes on by-product chemicals. Gasification processes are flexible, may be regulated to produce varying ratios of gasoline and chemicals.

If the proper balance is struck, if upgrading is successful, if markets can be found, the process could con-

E. E. DONATH: Wanted, a happy ending.

found its critics sooner than generally anticipated.

The Real Story: It's the "if" that Koppers is trying to lose. A hydrogenation pilot-plant is now going up at the company's Verona, Pa. research center to help clear up the uncertainty. The new unit will be capable of producing aviation-grade gasoline, but it's the aromatic chemicals—benzene, phenols, cresols, etc.—that will tell the real story.

And the story might well have a happy ending, if the competence of its authors are any indication. Heading up the Fuels Processing Section will be E. E. Donath, prominent in Germany's wartime synthetic liquid fuels research and more recently with the Bureau of Mines. Working with Donath will be C. C. Russell (manager, carbonization), G. V. McGurl (manager, gasification) and H. A. Gollmar (manager, by-product treatment)—all well-known coal technology experts.

•

Finishing School: Recent Advances in Industrial Finishes will be the topic of a symposium to be held under auspices of the Organic Coatings Research Laboratory at Case Institute of Technology, Cleveland, O. Planned as a short course in the fundamentals of paint as an engineering material, the symposium should appeal to those concerned with the selection, specification and application of protective and decorative coatings as a mass production operation.

Lecturers for the symposium will represent prominent industrial organizations, Army Ordnance Department and Case Institute.

New Polyesters: American Cyanamid Co. is now out with three new polyester resins that stand up to temperatures as high as 500 F without loss of strength. According to the company, its triallyl cyanurate monomer made possible the development of the new polyesters.

•

China Aid: An improved process for producing brilliant glazes on chinaware is the news from Battelle Memorial Institute, Columbia, O. Research, sponsored by the Vitrified China Assoc., was initiated as a result of china manufacturers' dissatisfaction with poor abrasion- and chemical-resistance of existing glazes.

The new glaze requires no strategic materials or equipment, depends on better firing techniques with conventional materials.

•

Add Water: National Adhesives Division of National Starch Products, Inc. now is offering its vinyl acetate copolymers in water emulsions as well as more familiar solvent solutions. Advantages of the new water emulsions: ease of handling; no solvent odor or flammability; easy thinning by spot addition of water. Potential applications are in heat-seal coatings, greaseproof coatings, adhesive formulations, binders for paper, fibers, cork and asbestos.

•

Ammonia Probe: A $2,500 grant-in-aid to Texas Technological College by Phillips Chemical Co. will be used to learn more about the agricultural applications of anhydrous ammonia. Researchers will attempt to work out a method of storing fertilizer ammonia in the soil, during the non-growing season, without loss of potency.

•

Stability Quest: Nordihydroguaiaretic acid, 2-tert-butyl-4-methoxyphenol, tocopherol and gallic esters are effective stabilizers for carotene, according to recent research results from the U.S. Department of Agriculture's Western Regional Research Laboratory (Albany, Calif.).

•

Hot Atom TEL: Researchers of Battelle Memorial Institute have produced what they believe to be the first radioactive specimen of tetraethyl lead. The tracer compound, incorporating carbon-14, will be used to determine the role of TEL in the chemistry of gasoline combustion.

Coming up: more tracer hydrocarbons (e.g. propane, butane and hexane) for additional fuel combustion investigations.

STEP UP PRODUCTION

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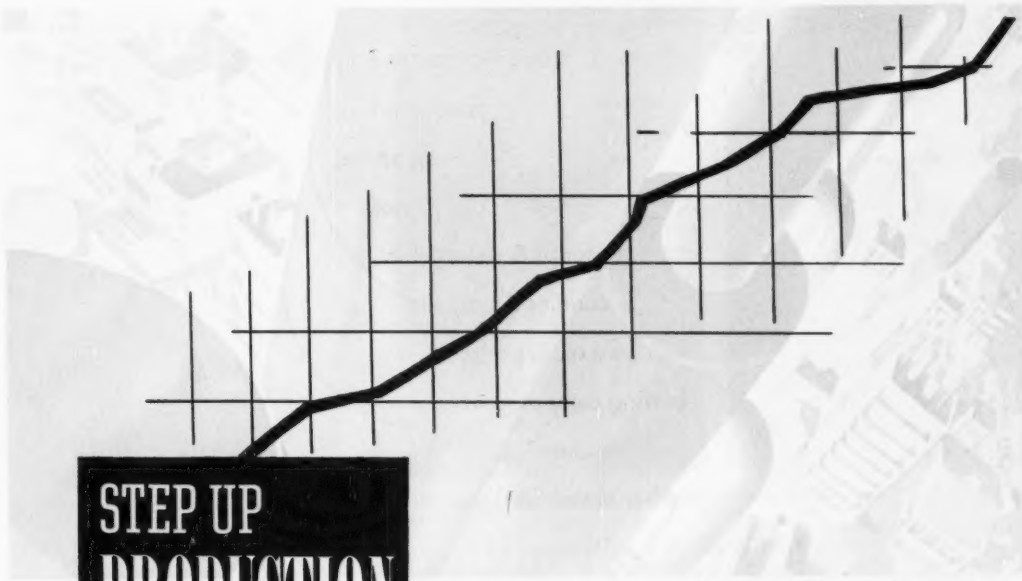

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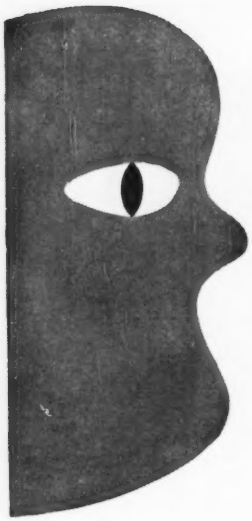

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FISHER, MARSHALL AND SANKEY: They disproved a theory to prove a process.

Who'll Take Vanillin Now?

New vanillin capacity is due in this year, and it will all come from the lignin of waste liquors.

Ontario Paper will commercialize a new process that uses lime instead of caustic soda.

The company expects that the process will permit cheaper vanillin, thus open up new markets.

Chances are that a few years from now vanillin users will look back on 1952 as the year of the big change; for sometime this summer Monsanto will start harvesting the fruits of its $1½ million West Coast investment in vanillin-from-lignin. Moreover, before the end of the year, Ontario Paper Co., Ltd., will bring in a similar ($1.3 million) operation at its Thorold, Ont., plant. Marathon Corp., U. S. pioneer in lignin vanillin, reports that it, too, is expanding capacity.

The perfume and flavor industries are the only important vanillin consumers, but the activity in vanillin carries a significance for the chemical industry that goes much deeper than a mere increase in production or a change in raw materials. The new facilities point up a definite switch in lignin processes; and, if the added production can bring a sizable cut in the present $3-a-lb. price tag for vanillin, it may open up a whole series of vanillin and derivatives for industrial applications. If the market opens up, more and more pulp producers may find that making vanillin from sulfite liquors is a good way of earning money and easing the waste disposal problem at the same time.

Question of Quantity: For some time annual vanillin production has been hovering between 900,000 and a million lbs. Just how much vanillin will be added by Monsanto's move is a moot question; for when the company starts up its production of vanillin from lignin, it will shelve its process for making it from coal tar sources (guaiacol). The picture is further complicated by the current status of producers who start with the naturally occurring eugenol. One of them reports that Far East price shenanigans on eugenol-containing oil have made it impossible to compete. As a result, it has shut down vanillin production until such time as the price of the oil returns to normal.

There is no question, however, about Ontario Paper Co., a *Chicago Tribune* subsidiary. It will bring new capacity as well as a new process and new ideas to the vanillin industry. An indication that the company is playing for big stakes: It has already sunk $400,000 in the lignin process, full-scale research is still under way to develop new markets for vanillin and its co-products. With a plant geared tentatively to produce 400,000 lbs. a year, the company says it is ready to increase capacity several-fold if the market warrants it. Dow Chemical's Bush Aromatics Division has a long-term contract and will market the bulk of the output.

The process itself is the result of a joint effort by three men: Charles Sankey, research director; J. H. Fisher, research engineer; and A. B. Marshall, of the Ontario Research Foundation. Ontario Paper has had a long-standing interest in finding a commercial application for the huge quantities of waste sulfite liquor. In 1943, the company put up at Thorold the first successful plant on the North American continent for making industrial alcohol by fermenting the sugars in the waste liquors.* Next step was finding a commercial use for the sugar-free liquor, and vanillin was a logical choice.

The idea of making vanillin from waste liquors is not new, of course: Marathon Corp., in this country, and Howard Smith Paper Mills, in Ontario, have been doing it on a commercial basis for fifteen years. Sankey, Fisher and Howard, however, set out to find a different and—they hoped—more economical process. They finally came up with a process that uses lime instead of caustic soda for forming the lignosulfonate.

Even that idea was not new; early researchers had tried it—but with disappointing yields. One worker, in fact, said he should have foreseen the poor results and intimated that any further attempts using lime would only be fruitless. The three Canadians proved differently, are able to get

* The plant is now turning out 700,000 Imperial gal. a year.

pure vanillin in yields large enough to make the process commercially attractive.

In their patented process,* lime is added to the lignin-containing material, which at Thorold undoubtedly will be the sugar-free waste sulfite liquor. The liquid and the sludge that result are agitated, and air is bubbled up through the reaction mixture. Because the pH must be kept above 12 and because the decomposition products of the lignosulfonic acid that form during the process are acidic, it is important to use an excess of lime. Proper agitation and gas flow as well as reaction temperature and pressure are critical, and dictate the time for reaction.

After oxidation is complete, calcium vanillate is present in both the liquid phase and the sludge, but it is much simpler to remove the product from the liquid. The most desirable distribution, therefore, is one in which the liquid phase contains a maximum of the vanillate. Accordingly, Sankey, Fisher and Marshall report their preferred method is to separate the liquid first, either by settling or filtration, then to acidify with carbon dioxide or other acidic material. In practice, they say, it may be economically sound to discard the sludge entirely.

The Canadians have adapted their process to continuous processing and have showed that the resultant increase in yield is greater than that predicted by theory. They have shown further that optimum yields can be obtained with a single reactor, rather than with several in series.

Case of Competition: But despite the new process, Ontario Paper will run up against some stiff competition with Marathon and Monsanto. Actually, Marathon's vanillin* is produced by Salvo Corp. (subsidiary of Sterling Drug) and sold by Sterwin Chemical (also a Sterling subsidiary). Marathon precipitates calcium lignosulfonate with lime, then filters continuously under vacuum. Next the filter cake is dissolved in caustic and piped to Salvo. Presumably, Salvo uses an air oxidation to form the vanillate, then removes the vanillate by a countercurrent extraction with butanol. The butanol can be recovered in a reusable condition by a second countercurrent wash with water containing small quantities of caustic.

Monsanto, too, is a pioneer in vanillan, which was its second product. In 1904, it started producing it from eugenol. Then in 1929, the company started making it by the guaiacol synthesis. Under its new setup, Monsanto will barge lignin from the Puget Sound Pulp & Timber Co., semi-refine it in a Seattle plant, then ship it to a plant in St. Louis for final processing.

Although the company is cagey about details, the process is probably similar to Marathon's. In fact, unofficial sources say that Monsanto delayed decision on its new project for a full month on word from patent attorneys that there was a possibility of infringement on Marathon-Salvo patents. In any event, it would be a good guess that Monsanto has a few process tricks up its sleeve; else, with purchased raw material and the long haul from Seattle to St. Louis, the company would be hard put trying to compete with Marathon and Ontario Paper.

Matter of Markets: The Canadians say that the big advantage for their process lies in the fact that no caustic is consumed. And, they say, it's not just a case of substituting lime for caustic, for the competitive processes consume an equivalent amount of lime. They point out that the huge amounts of caustic used in the processes means that it must either be regenerated or sold in combination with residual liquors. Marathon chooses to sell it as is, but with the lignin vanillin capacity due to come in, that market conceivably would soon be saturated.

Besides vanillin, Ontario Paper's new plant will turn out large quantities of vanillic acid and acetovanillone. In addition, several by-products are obtained which may prove commercially significant. One of these is a fine, water-insoluble powder which displays ion-exchange characteristics, is highly adsorbent, readily wettable, and thixotropic in aqueous slurries. The company thinks it looks promising as an insecticide carrier and extender. It says the material seems to have properties equal or superior to diatomaceous earths and will be available at a lower cost.

Ontario Paper anticipates no difficulty in finding a market for its vanillin output in Thorold, sees immediate and potential applications in metalworking industries.

In addition, the company looks on the co-products and by-products as important assets for the new process and expects they will help push the price of vanillin down to a point where it will be more attractive as an industrial chemical. It remains to be seen just how low the price can go; and that will have to be determined before its potential can be accurately measured.

* U.S.P. 2,576,752; 2,576,753; 2,576,754.

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Piped Ore Means More Nickel

AID IN UPPING PRODUCTION of nickel is International Nickel Co.'s newly completed 7½-mile wooden pipeline for carrying bulk ore concentrate from the company's Creighton concentrator to its reduction plants at Copper Cliff, Ont. The pipeline enables the company to use lower-grade ore than is possible with more expensive transportation. Designed for severe weather, the pipeline has endured —30 F.

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KAY-FRIES

Cyanoacetamide

$CNCH_2CONH_2$

CYANOACETAMIDE (both a nitrile and an amide) is another Kay-Fries intermediate with a cyano-activated methylene group. It is now used in the syntheses of vitamins and barbiturates. Potentially its usefulness can be expanded. It has been suggested as an intermediate for special resins, substituted piperidines and pyridones, new pharmaceuticals and general organic synthesis.

KAY-FRIES SPECIFICATIONS . . .

purity	• 99.0% min.
melting point	• 119.0°-122.0°C (meniscus to complete melt)
ash	• .05% max.
solubility	• 1 gm. completely soluble 9 gm.dist.H_2O

Typical reactions of CYANOACETAMIDE

REDUCTION

$$CNCH_2CONH_2 + 2H_2 \xrightarrow{\text{catalyst}} NH_2CH_2CH_2CONH_2$$
amide of β-alanine

DEHYDRATION

$$CNCH_2CONH_2 \xrightarrow{\text{catalyst}} CNCH_2CN + H_2O$$
malononitrile

CONDENSATIONS

$$2CNCH_2CONH_2 + RR'C{=}O \xrightarrow{\text{catalyst}} RR'CCH(CN)CONHC(=NH)CHCONH_2 + H_2O$$
ketone or aldehyde — substituted piperidine

$$CNCH_2CONH_2 + RCOCR'HCOR' \xrightarrow{\text{catalyst}} RC{=}C(CN)CONHCR''{=}CR' + 2H_2O$$
diketone — substituted pyridone

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That should not be construed to mean that a prospective buyer can rush out and grab all the metal he wants. As Du Pont is quick to point out, the situation will probably reverse itself when the defense effort gathers momentum. Du Pont says the reason for the present lag in demand is that development of new applications has not kept stride with the advance in production techniques.

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Sampling Viscometer: Norcross Corp. has brought out an automatic sampling viscometer which it thinks should find applications in chemical processing. The viscometer can withdraw a sample from a closed system, bring it to temperature, measure and record the viscosity. Samples can be as small as 25 cc., measurements can be made every three minutes. For continuous processes, the viscometer is equipped with signals to indicate high and low points. In batch processes, one signal can indicate the approach of the end point, the other will show when the end point is actually reached.

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Salt-Water Soap: Fleisher also gave these new Federal specifications for a better lathering, more efficient, more attractive salt-water bar soap, replacing the old 51-S-46 formula:

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Lawn Restorer

Parched lawns spotted brown by summer drought will be a rarity out Portland, Oregon way if Fortified Farm Products Co.'s new Nitro-Mulch —a fertilizer, vermiculite, compressed peat moss mixture—is all it's claimed to be.

Because of the product's unusual water-retaining properties (one pound of Nitro-Mulch will absorb one gallon of water), lawns treated with the mixture are said to require only two hours watering per week even in the driest weather.

Besides the vermiculite and dehydrated peat, the product contains the following chemicals: ammoniacal nitrogen, 3%; superphosphate-derived phosphoric acid, 6%; and water-soluble potash derived from muriate and sulfate of potash, 6%.

Fortified Farm Products Co. markets Nitro-Mulch in 25-lb. bags (coverage: 1,000 sq. ft.) at $2.98, and 50-lb. bags at $5.95. Currently distribution is planned for Washington, Oregon, and California only, but sales will be extended to other areas as soon as formulas suitable for other weather and soil conditions are worked out.

Dutch Elm in Dutch

Latest chemotherapeutic agent developed to combat Dutch elm disease is 2-methylcarboxymercaptobenzothiazole. First tried in A. E. Dimond's research at the Connecticut Agricultural Experiment Station, the new compound promises to be more effective than oxyquinolinebenzoate or the patented Carolate*. It's easier to apply (foliage spray rather than soil application) and will likely be cheaper.

Super-optimistic news stories at the time of Dr. Dimond's announcement went so far as to claim that the Dutch disease was licked and oak wilt, groggy; Dimond, and his associate, David Davis, want at least another year's trial with the elm, and are only guardedly hopeful concerning the oaks.

As a chemotherapeutant, 2-methylcarboxymercaptobenzothiazole works within the tree, fighting the fungus in a manner as yet not clear. DDT, on the other hannd, has proved an effective preventative by virtue of its toxic effect on the elm bark beetle, which spreads the disease. Since emulsions of the new compound and DDT can be combined, Dimond predicts the effectiveness will be multiplied.

Dimond states that as far as he knows, no manufacturer has begun quantity production of 2-methylcarboxymercaptobenzothiazole on the basis of his tests. Curiously, only apparent application of the thiazole heretofore has been in the rubber industry; Goodyear has a patent covering use in vulcanization.

* Developed by the Rhode Island Experiment Station and Bartlett Tree Research Labs, it is essentially 99% lime, with urea, salicylic acid, and a yellow dye; not yet available commercially.

Index Indicators

Manufacturers of household specialty items, striving to boost sales fast enough to make up for the squeeze between rapidly rising operating costs and price-fixed ceilings can look to food stores as growing outlets, according to Nielsen Index* figures sketching 1951 soap trends.

The report, delivered at the Soap and Glycerine Producers meeting last week, noted that dollar volume for all types of soap products in 1951 was up 8% over 1950 figures, due to inflationary price jumps, but that on a tonnage basis, volume was actually down 4%.

But soaps of all kinds were 2% higher tonnage-wise than food store sales generally, and tonnage volume of household detergents actually rose some 17% during 1951.

Another trend revealed by the survey: 67% of the foodstores checked were carrying 10 or more different drug commodities—shampoos, toothpastes, etc.—as compared to 49% in 1947.

Big Store Selling: This was especially true of the big food chains and independents. All food stores are selling more of all products, the report showed, but the grocery giants are making the big bid for consumers' dollars by widening lines.

Last year chain food stores and large independents accounted for 50%-75% of food and household supply sales across the nation. This, despite the fact that the big stores account for a low of 8% of the total grocery stores in the Southeast, a high of 40% of the stores on the Pacific coast. Nationwide they actually represent less than 20% of the total number of food stores in business.

And the American people are buying more food store products than ever before. Last year, the Nielsen Index estimates, more than $30.4 billion was spent on grocery store items, a hike of 253% over 1939 sales. Even when careful adjustments are made for inflationary conditions, the report continues, there is still a real gain of 50% in purchases made.

The index credits this buying wave to a 17% boost in population, a 70% hike in real consumer income, and the surge in consumer demand resulting from development, improvement, and promotion of food store products —including cleaning agents, polishes and toilet goods.

* A. C. Nielsen Co.'s special presentation to American Soap and Glycerine Producers Assoc. on household soap trends.

OPEN-FACED CARTON introduced by Schenley Laboratories simplifies packaging of its drug products. Purpose of the cutaway design is to eliminate labeled cartons. With the new box, the label on the bottle gives double service as label for both.

•

Southern Cleanup: New plant for detergent manufacture is under construction in Aiken, S.C. Associated Chemicals Co. will produce industrial detergents there under patents of Far-Best Corp. (Los Angeles and Chicago) making use of readily available South Carolina kaolin. Distribution through eight southern states—Virginia, the Carolinas, Georgia, Florida, Alabama, Mississippi and Tennessee—is planned.

•

New Primers: A white synthetic undercoat, claimed to give marginal wood the appearance and finish qualities of gumwood, has been marketed by United Lacquer Mfg. Corp. (Linden, N.J.). Developed originally for fir, this rapid-drying primer, says United, can be used on poplar, bass, pine and gums as well. Price, to industry only: $2.45 per gallon at Linden.

Du Pont Sealer-Coater, an undercoat for wall painting, said to dry in less than two hours, has been placed on the general market. Sold in semi-paste form, and thinned with water, the Du Pont product can be used with all finish paints except the rubber-based types. Selling point: A store can be painted overnight and be ready for business next day.

•

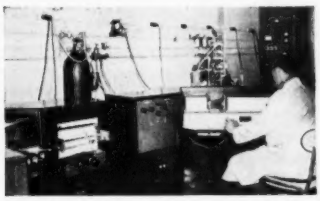
Greener Greens: Calocure, a formulation of mercuric chlorides, is the name

THE PERKIN-ELMER

INSTRUMENT DIGEST

A condensation of some of the articles appearing in the Winter issue of THE PERKIN-ELMER *INSTRUMENT NEWS*, a quarterly publication of The Perkin-Elmer Corporation, manufacturers of scientific instruments—Infrared Spectrometers, Tiselius Electrophoresis Apparatus, Universal Monochromator, Flame Photometers, Continuous Infrared Analyzer, Low-Level Amplifiers—as well as Astronomical Equipment, Replica Gratings, Thermocouples, Photographic Lenses, Crystal Optics, and Special Instruments for the Government. **For further information, write The Perkin-Elmer Corp., Norwalk, Conn.**

Norwalk, Conn. | February, 1952 | Vol. 3, No. 3



High school graduates operate Model 12 Spectrometers at Julius Hyman & Co.

24-Hour Infrared Schedule Controls Julius Hyman Production

Two Perkin-Elmer Model 12-C Infrared Spectrometers, operating on a 'round-the-clock schedule, check on virtually all research, technical service and plant production activities at Julius Hyman & Company, Denver, Colorado. The carefully scheduled and supervised program enables Julius Hyman to run 4000-4500 analyses per month with high school graduates as spectrometer operators.

Work Loads—In plant production, infrared spectrometry is used for: control analyses for insecticide production units; control analyses for pilot plant operations; control of specifications on incoming materials. Also, production - development samples are run along with routine plant samples for comparison.

Infrared spectrometry also functions in technical service by determining micro amounts of aldrin and dieldrin, Hyman's potent new insecticides, used in toxicological and field residue studies. For technical service, infrared also checks on formulation samples, such as wettable powders or emulsions, from production runs.

Julius Hyman's research program is also centered around infrared. Complete spectra of pure compounds are obtained for the rock salt region and the potassium bromide region, if possible. The research spectroscopist then carries out correlation and structural studies.

You can receive 8-page Instrument News.
Write The Perkin-Elmer Corporation, Dept. CW, Main Avenue (Route 7), Norwalk, Conn.

Featured in the Winter issue are:

ELECTROPHORESIS IN SHOCK
Article by D. Moore and D. Worf

INFRARED AT JULIUS HYMAN
Product Control Story

NEW INFRARED LABORATORY
Aid in Evaluation

Instrument Laboratory Aids Companies To Evaluate Infrared Analysis Methods

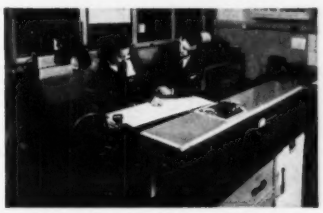
A laboratory has been set up by Perkin-Elmer for the evaluation of infrared spectrometry. Small companies must carefully evaluate the large outlay of money and personnel required for application of infrared methods. It is hoped that this laboratory will enable such potential users to arrive at an equitable decision, by providing laboratory facilities at no charge.

Laboratory—The laboratory has been established at Norwalk for operation of a Model 112 and a Model 21 Infrared Spectrometer, as well as a flame photometer and a Tiselius Electrophoresis Apparatus.

Those interested in possible infrared applications should communicate directly with Harry Hausdorff, chemist in charge of the laboratory, explaining in detail the problem to be solved and particularly the state of the samples to be studied.

Samples – If the problem is solvable by infrared, a small number of samples for preliminary evaluation should be sent to the laboratory for spectral study. If possible, it would be preferable if the interested person could bring the samples to our site to observe the instrument operation (or run it himself) and discuss the results. Discussion of a technical problem can become very tedious by correspondence. If a visit is not feasible, the samples can be sent in the state agreed upon, spectra run, and returned with comments.

If a reasonable amount of further study is required, it can be done by Perkin-Elmer at no charge. Or if the program is too extensive, arrangements may be made to rent an instrument. If the instrument is purchased, a percentage of the rental fee may be applied to the purchase price.



Perkin-Elmer Instrument Laboratory

New Instruments – A greatly improved Perkin-Elmer Monochromator and Infrared Spectrometer are described on pages 4-5 of the Winter INSTRUMENT NEWS. Featured in both instruments is a new double pass optical system that gives double monochromator performance with single monochromator simplicity.

Electrophoresis Used in Traumatic Shock Studies

One of the conditions universally associated with traumatic shock is the decrease in circulating blood volume. It has long been known that fluid from the circulatory system enters injured tissue, and recently evidence has been added that this fluid contains serum albumin. The barrier between the circulatory system and the tissue cells is in some way lowered so that there is an exchange of the substances on the two sides of this barrier. It appears that an injury which produces necrosis or partial necrosis of tissue is followed by an autolysis which partially destroys the membranes separating the vascular bed from the tissue.

It has now been shown that the autolysis can be retarded, as would be expected, by lowering the temperature of the injured area.

Post-Mortem Findings—The injured limbs of experimental animals were amputated at the knee, skinned and minced with scissors, whereupon the untreated ones exuded large quantities of fluid, but the cooled limbs produced little or none. No exudates were obtained from the tourniquet injuries when the limbs were cooled. In scald injuries the quantities of exudate from the control leg was from 10 to 15 times greater than that obtained from the cooled legs. In scald injuries, there was a watery, gelatinous, deeply-blued layer underneath the skin of the untreated control limbs, whereas the cooled legs had a normal appearance.

Electrophoretic analysis of the exudates confirmed the presence of serum albumin.

These experiments would seem to indicate that it might be possible to prevent the development of shock by cooling the injured area. Such a conclusion has already had experimental support.

Digest of an article by D. Moore and D. Worf in Winter '52 INSTRUMENT NEWS.

of Malinckrodt Chemical's new turf fungicide. Developed with the Rhode Island Experiment Station, Calocure is said to control both brown patch and winter mold. It can be applied either as a spray or broadcast with sand.

•

Wood Preservative: Permodip is the name applied to a series of wood preservatives based on Monsanto's pentachlorophenol. Containing 5% of PCP, the new products can be applied by painting or by dipping. Formulation and prices vary as to use. The manufacturer is E. and F. King & Co. (Norwood, Mass.)

•

Tilden Change: The Tilden Co., New Lebanon, N.Y., pharmaceutical house will open a new branch office in Chattanooga, Tenn., February 11. Tilden plans to close its St. Louis office when the new office is in full operation.

•

Fertilizer Factory: A fertilizer plant with a 20,000 ton capacity has been scheduled for Oklahoma City; construction to begin in early February. Superphosphates, ammonium nitrate, ammonium sulfate, and rock phosphate are to be made in the $235,000 factory of the Oklahoma Fertilizer Co., slated for production by autumn.

•

Insulating Varnish: Electrofilm Corp. (North Hollywood, Cal.) is selling a new insulating varnish which it claims has the advantages of silicones, but is less expensive. It's tagged Insul-Film, and is recommended for temperatures up to 400° F. A sample kit is available at $1.00, quarts are $4.25, gallons $16.00.

•

Plugging Pastes: Miracle Tub-Caulk, a compound for water-proofing and filling cracks around sinks and showers, is the latest product of Miracle Adhesives Corp. (NYC). Nationally available now, Tub-Caulk is sold in 4 oz-tubes for $1.00.

•

Distinctive Duster: New applicator for Mysterious Roach Powder (Nykon Chemical Corp., Mt. Vernon, N.Y.) and Magikill Ant Dust (Lethelin Products Co., Mt. Vernon, N.Y.) is a rubber bulb-spray tip which fits on the dust can. The new container-and-cap is said to be easily refillable, and discharge of dust can be regulated by varying pressure on the bulb.

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Enamel Resin: Rohm & Haas has developed a resin for baking-enamel formulations called Uformite M-311. It's an alkyd-modified triazine-formaldehyde resin designed for white enamels generally used on kitchen appliances. In quantity production now, it's 34½¢ per lb. in car load lots, 35¢ LCL.

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Ice Nonskid: Normandy Chemical Corp. (Muskegon and Port Huron, Mich.) is greeting winter with Saif Icemaster, a chemically impregnated granular product designed to give firmer tread on ice. It is consumer-packaged in plastic bags.

•

Apricots Growing Peachy: At the University of California, a research program conducted on apricots is more than bearing fruit. Julian C. Crane, hormone specialist, and Reid M. Brooks, cherry and apricot man, in charge of research, have found that 2,4,5-T sprayed on apricots not only hastens maturity of the fruit, but boosts their size 10%.

Used for several years to hasten ripening of figs, apples, and peaches, 2,4,5-T was applied to royal apricot trees during thinning operations. The hormone treatment resulted in fruit with flesh over 20% thicker, maturity 18 days ahead of schedule, and no increase in pit size.

Further experimentation is necessary before commercial recommendations are made since the potent weed killer damagd the tips of the young branches.

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Branch Expansion: Parke, Davis & Co. will open a new branch headquarters in mid-town New York as well as warehouses at Teterboro, N.J. and Menands, N.Y.

•

Muscle Relaxer: A new synthetic drug —2,5-bis-(3 diethylaminopropylamino) - benzoquinone-bis-benzylchloride —is now being distributed nationally by Winthrop-Stearns, Inc. as an agent for relaxing muscle spasm. The new compound (marketed as Mytolon Chloride Solution) is said to obtain maximum muscular relaxation without causing such side effects as bronchial spasms, histamine release, or falling blood pressure.

•

Synthetic Palm Oil: An ersatz palm oil (Palmoshield) duplicating all the chemical characteristics of its imported counterpart, has just been placed in production by the Ironsides Co. (Columbus, O.). The new lubricant—formulated for use in cold rolling steel production, and both hot dip and electrolytic tinning—is claimed to look, feel, act, and handle exactly like palm oil. It is said to be superior in that it is subject to exact chemical control, can be made from domestic materials.

BOOKS . . .

Engineer's Illustrated Thesaurus, by Herbert Herkimer. The Chemical Publishing Co., Inc., New York, N.Y.; 572 pp., $6.

This volume reproduces, identifies, and explains, when necessary, the function and operation of all available types of machine elements and assembled machinery. Designed to aid the engineer, designer, draftsman and manufacturer in selecting the machine parts of equipment suitable for a particular purpose, the book covers such main categories as fasteners, adjusting devices, supports and structures, basic mechanical movements, combustion, transportation, industrial processes, electrical appliances, etc.

French-English Science Dictionary, second edition, edited by Louis DeVries. McGraw-Hill Co., New York, N.Y.; 596 pp., $6.50.

Original text of the volume has been retained except for minor revising. Major change is the inclusion of a supplement of terms in aeronautics, electronics, radar, radio, and television which covers terminology newly introduced into the language as a result of developments in these fields. Basic science vocabulary for students in agricultural, biological and physical sciences is presented.

Synthetic Resins and Allied Plastics, third edition, edited by R. S. Morrell, other editions edited by H. M. Langton, Oxford University Press, New York, N.Y., xvii+747 pp., $10.

Plastics have invaded every industry today, and the current edition of this volume attempts to cover the new advances made along this line. Various sections written by experts are devoted to the different types of resins and plastics, along with chapters dealing with revised theories, problems of resinification, electrical testing, and methods of identification and testing. A new subject covered here is that of shellac.

Briefly Listed

ANSCO ABSTRACTS, monthly review of technical literature, giving information on photographic technical developments, literature references, new literature and patents. In addition to covering the various aspects of photography, the publication reports on graphic arts, physics and chemistry, and on the applications of photographic principles in various fields. Library of the Research Dept., Ansco, Binghampton, N.Y., $5 per year.

THE SYSTEM OF MINERALOGY, seventh edition of Vol. II, 1124-page revised edition of Dana's work affords description

BOOKS . . . . . .

of various minerals as to classification, morphological and X-ray crystallography, habit, physical properties, chemistry, synthesis, etc. John Wiley & Sons, Inc., 440 Fourth Ave., New York, N.Y., $15.

RADIOASSAY OF URANIUM ORE WITH THE GEIGER TYPE EQUILIBRIUM COUNTER, by R. D. Wilmot and C. McMahon, 53-p. study dealing with basic theory, procedures in assaying and apparatus required for determining uranium content in ores by means of radioassay. Material is directed specifically for those interested in providing their own facilities. Dept. of Mines and Technical Surveys Mines Branch, Ottawa, Canada.

EXCESS PROFITS TAX, 289-page Government publication dealing with the recent excess profits tax rulings arising out of the Excess Profits Tax Act of 1950, along with a discussion of typical tax situation problems. Superintendent of Documents, Government Printing Office, Washington 25, D.C.; catalog No. T22.17: 130, 60¢ per copy.

PRODUCTIVE MAINTENANCE, 12-minute sound slidefilm presenting visual report on the main elements of the productive maintenance program, including three case histories which illustrate the program's application in industrial plants. General Electric Co., apparatus sales offices or service shops. Free on request.

MEETINGS...

Technical Assn. of the Pulp & Paper Ind., annual meeting, Commodore Hotel, N.Y., Feb. 18-21.

Manuf. Chemists' Assn., air pollution abatement conf., Statler Hotel, N.Y., Feb. 25-26.

Drug, Chemical & Allied Trades section of New York Board of Trade, annual dinner, Waldorf-Astoria Hotel,, N.Y. Mar. 6.

Natl. Assn. of Corrosion Engineers, annual conf. & exhibition, Buccaneer Hotel, Galveston, Mar. 10-14.

Natl. Farm Chemurgic Council, annual conf., Statler Hotel, St. Louis, Mar. 11-12.

Soc. of Plastics Ind., Inc., national plastics exposition, Convention Hall, Phila., Mar. 11-14.

Amer. Inst. of Chem. Engineers, Atlanta Biltmore Hotel, Atlanta, Mar. 16-19.

Coml. Chem. Dev. Assn., annual open meeting, Statler Hotel, N.Y., Mar. 20.

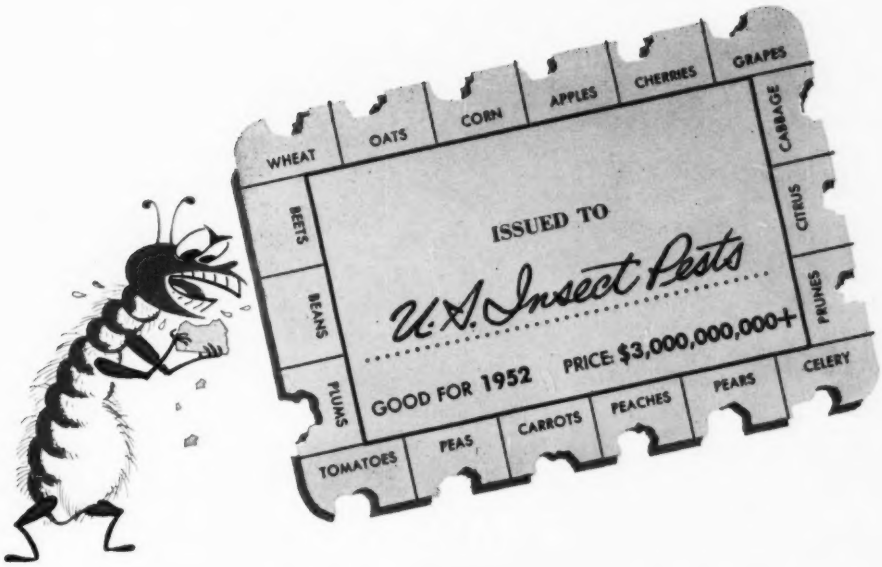
Chicago Intl. Trade Fair, Navy Pier, Chicago, Mar. 22-April 6.

Amer. Chem. Soc., national meeting. Buffalo, Mar. 23-27.

Packaging Machinery Manufacturers Inst., semi-annual meeeting, Dennis Hotel, Atlantic City, Mar. 30-31.

PICTURES IN THIS ISSUE:

Cover (top)—Woburn Chem. Corp.; Cover (center)—Official Defense Dept.; Cover (bottom)—Standard Oil Co.; p. 11—Max F. Kolin; p. 14—Dick Wolters, McGraw-Hill; p. 27—Harris & Ewing; p. 30—Koppers Co.; p. 34—Intl. Nickel Co.; p. 37—Wide World.



Billion Dollar Meal Ticket

YOU'D probably be startled to read a full report on this nation's annual crop losses due to insect pests. Corn borers alone, for example, destroyed over $100,000,000 worth of corn in a single year. The nation's total loss to insects—and it's a loss that's felt right down to *your* dinner table—is estimated at between *three and five* billion dollars for last year!

But there *is* a brighter side to the picture: This great plunder of the nation's larder is being steadily reduced each year, thanks to the chemical insecticides, weed killers and brush killers that are constantly being developed and improved for the American farmer. With just a few pounds of these amazing chemicals, he can free an entire acre of destructive insects or weeds . . . safely, quickly and inexpensively.

As a basic producer of such coal derived farm chemicals as DDT and Parathion insecticides and 2,4-D weed killers, the Pittsburgh Agricultural Chemical Company is proud to be a leader in the nation's progressive agricultural chemical industry.

The same step-to-step production control which makes *Pittsburgh* synonymous with high quality in agricultural chemicals also assures American industry of reliability when it uses the coal-derived products of our other integrated divisions.

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- ★ Organic Phosphate Insecticides
- ★ Weed and Brush Killers
- ★ Cotton Sprays and Dusts
- ☆ Special Agricultural Chemicals

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COAL CHEMICALS • AGRICULTURAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

Many have tried...
More will try...
to imitate

DREW COCONUT FATTY ACIDS

To imitate is to compliment. And we *are* complimented by producers who try to imitate the composition, color, stability and freedom from odor of Drew Coconut Fatty Acids.

Invariably, two ingredients—lack of experience and specialized knowledge—doom such attempts to failure. It is Drew's possession of these, together with modern research and production techniques, that give you a product *plus* that is an essential part of every Drew Coconut Fatty Acid.

When you think of coconut fatty acids, remember these simple facts:

- Drew's coconut fatty acids are distilled and fractionated to improve odor, provide long-lasting color stability, and give greater soap value.
- Drew is one of the world's largest producers of coconut fatty acids.
- Wherever specifications call for quality coconut fatty acids, note how often you see the phrase: "E. F. Drew or equal."

If *quality* has made your product famous . . . if you want to establish *quality* in your product . . . don't be satisfied with imitations. Always specify Drew fatty acids.

Write for reference booklet, "Drew Fatty Acids"

Distilled and Fractionated Fatty Acids:

COCONUT LAURIC STEARIC OLEIC SOYA LINSEED COTTONSEED
CAPRIC CAPRYLIC MIXED VEGETABLE

TECHNICAL PRODUCTS DIVISION

E. F. DREW & CO., INC.

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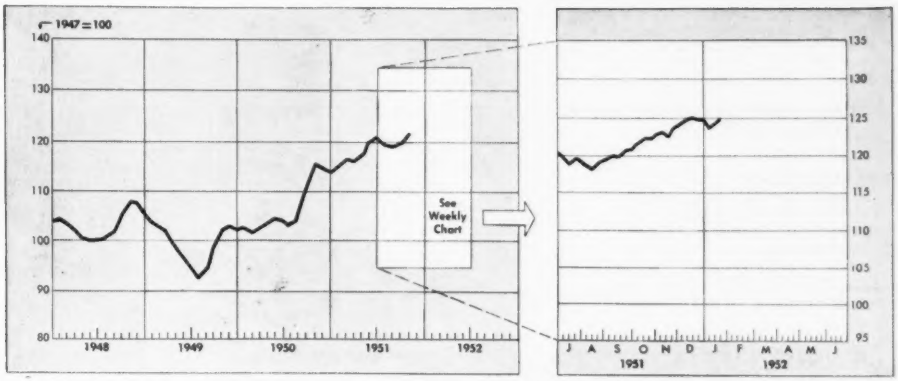
CHICAGO PHILADELPHIA BOSTON

DREW PRODUCTS

MARKETS . . . . . .



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries

MARKET LETTER

Supplies of sulfur were divided among the free countries of the world this week by the International Materials Conference. The estimated shortage for this year is 1.54 million long tons of sulfur. During the next six months, by the IMC decision, U.S. will have an export quota of 465 thousand tons, and will be allowed to keep 2.23 millions tons of its production at home.

Copper sulfate output is, of course, limited by shortages of copper and sulfuric acid, and it can't be upped readily to meet the fungicide demand which starts to climb this time of year.

To make sure that domestic demands are satisfied, producers are trying to channel this tight item into the market at home. The Office of International Trade, in turn, keeps close tabs on exports. Result: Overseas shipments to the banana countries and France are less than half what they were last year.

Henceforth, those interested in bidding on Government contracts will have the benefit of knowing the dollar value of all awards. This is a change in policy for the Defense Department, which originally banned the publication of all awards exceeding $250 thousand, on the grounds of jeopardy to the defense effort. Over-riding consideration: speeding the farming-out to sub-contractors.

For most chemicals, NPA officially believes that the shortage won't be relieved until next fall; after that, supply improvement should be general. But quite a few in the chemical industry find that the improvement has arrived already, even on some of the chemicals that NPA considers on the short side.

For instance: NPA still regards resorcinol as tight, on the basis of this year's probable requirements for military and civilian purposes. Though these are on the rise, Heyden's 600 thousand pound-a-year plant will be a safety valve for demand pressures.

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL INDUSTRIES Output Index (1947=100)	125.2	125.0	117.4
Bituminous coal production (daily average, 1000 tons)	1,888.0	1,960.0	1,863.0
Steel ingot production (thousand tons)	2,079.0	2,065.0	2,025.
Wholesale prices—chemicals and allied products 1926=100)	133.5	137.5	144.9
Stock price index of 14 chemical companies (Standard & Poor's Corp.)	245.8	245.1	213.1
Chemical process industries construction awards (Eng. News-Record)	$71,290,000	$6,217,000	$19,542,000

MONTHLY BUSINESS INDICATORS—TRADE (Million Dollars)	MANUFACTURERS' SALES			MANUFACTURERS' INVENTORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	$22,582	$22,592	$20,524	$41,462	$41,354	$32,245
Chemicals and allied products	1,569	1,608	1,441	3,016	3,004	2,280
Paper and allied products	660	695	641	956	942	687
Petroleum and coal products	2,107	2,102	1,866	2,582	2,582	2,225
Textile products	1,154	1,167	1,132	2,899	3,048	2,462
Leather and products	208	265	262	591	607	540

The current boom in phenol expansion won't be hindered appreciably by the lack of chlorine and sulfuric acid, though both are short of demand. Reason: Neither is needed in making phenol via cumene (isopropylbenzene), a process used for much of the new production.

Hercules will build one of these new phenol plants itself, will license the process to others including Barrett and Oronite. The latter will be the first on the West Coast.

Benzene, needed in all three major processes, and expected to stay on the short side for over a year, will be a limiting factor in phenol expansion. However, Hercules won't face this supply problem in making p-cresol by a similar process from p-cymene, obtained from plentiful naval stores terpenes.

Solvent buyers will be eyeing the stepped-up output of acetone, which will be a coproduct in this process. The market for solvents has been none-too-robust in the past few months. These added supplies could well be a softening influence next year.

Most pigments and other paint ingredients are generally in better supply than the last time—about three months back—the situation was studied by NPA and the Paint Industry Technical Committee. The improved supply is largely due to concurrent slackening in civilian needs and Government procurement. Better supplies of lead and zinc pigments are now available and some easing in formaldehyde and pentaerythritol stems from newly-added output.

When methyl chloride was decontrolled last week by NPA, it seemed that methylene chloride would get the same treatment. In fact, this report was widely circulated. But it is evident from NPA estimates that supplies are still quite short of demand. Monthly requirements average 7 million pounds, supplies only around 4 million. Until supply and demand come more nearly into balance, the chances of decontrolling methylene chloride are slim.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending January 28, 1952

	Change	New Price		Change	New Price
UP					
Inositol, drums, deld.	$ .70	$5.60	Tin metal	$ .185	$1.215
DOWN					
Aldrin, 60%, drums, c.l.	.17	.93	Oiticica, oil, tanks	.005	.26
Dieldrin, Tech., drums, c.l.	.45	2.60	Quicksilver, 76 lb. flask	3.00	206.00
Naphthalene, crude, imp.	.005	.10			

All prices per pound unless quantity is stated

It's time we got *working* mad!

As we listen to the latest insults from Moscow, we're likely to get fighting mad.

Instead, we'd better use our heads and get *working* mad.

It is clear by now that Stalin and his gang respect just one thing—strength. Behind the Iron Curtain they've been building a huge fighting machine while we were reducing ours. Now we must rebuild our defenses—*fast.*

As things stand today, there is just *one* way to prevent World War III. That is to re-arm—to become strong—and to stay that way!

This calls for better productivity all along the line. Not just in making guns, tanks and planes, but in turning out civilian goods, too.

Arms must come first. But we must produce arms *at the same time* we produce civilian goods.

We can do this double job if we all work together to turn out more for every hour we work—if we use our ingenuity to step up productivity.

All of us must now make sacrifices for the common good. But we're working for the biggest reward of all —*peace with freedom!*

THE BETTER WE PRODUCE THE STRONGER WE GROW

A PUBLIC SERVICE PROJECT · THE ADVERTISING COUNCIL

FOR A FREE COPY OF "THE MIRACLE OF AMERICA"

MAIL THE COUPON to Public Policy Committee, The Advertising Council, Inc., Dept. B.P., 25 West 45th Street New York 19, N. Y.

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McGRAW-HILL PUBLISHING COMPANY

BHC PRODUCTION: In the land of cotton, it's tough on the weevil.

Bug Business Is Big Business

Output of DDT and benzene hexachloride (BHC) is at record high, about 120 million pounds a year each.

Toxaphene production, rising rapidly, should be around 100 million pounds yearly in 1953.

This year will be marked by larger exports, keener competition, and rechecking of production goals.

Along about this time of the year, insecticide producers and mixers start pacing the floors of their respective offices. Both are keeping a weather eye on crop prospects, because as the farmer goes, so goes much of their business for the year. Unfortunately, they must wait until nature decides on the bug population, and nature can't be rushed.

One of the earliest—and most important—signs is the first cotton planting of the year in the Rio Grande valley around the first of February. Within sixty days after that time, most of the U.S. cotton fields will have been planted, giving the insecticide producers an accurate estimate of how big a demand will develop.

Cotton's Kink: From the producer's standpoint, prospects in Texas are not overly encouraging. The weather has been dry and the soil needs moisture. These conditions not only make for a small cotton crop, but also tend to make life a problem for the boll weevil and the boll worm. If these conditions are prevalent, cotton farmers would be reluctant to buy insecticides, making the producers and mixers unhappy about the whole thing.

But the insecticide industry by now is used to lean and fat years.

What is of greater concern to sellers is the likelihood that insecticide output has exceeded the current U.S. demand. That means either a cutback in production or expanding the market, either at home or abroad.

Three on Top: Only a decade ago, the combined output of organic insecticides was a paltry few million pounds a year. Now the production capacity is in the neighborhood of 350 million pounds.

Top three in this group: DDT, benzene hexachloride (BHC), and toxaphene. According to estimates made by the NPA, the DDT capacity is 120 million pounds annually; BHC, possibly slightly more. Official figures are not available for toxaphene, since Hercules Powder Co. is the only producer. But it wouldn't be amiss to put current toxaphene output around 75 million pounds a year. When Hercules' new plant now a-building at Henderson, Nev. is completed shortly after the first of next year, total toxaphene output will probably hit the 100 million pound-a-year mark.

Cater to Cotton: All three of these high-volume pesticides are used against cotton insects, with a major portion of BHC and toxaphene production ending up in cotton fields. DDT and BHC team up in the well-known 3-5-40* and 3-5-0* formulas; DDT tackles the boll worm and BHC, the boll weevil. Toxaphene has been effective in handling both pests. Both DDT-BHC and toxaphene formulations have their proponents.

In California, where the boll worm is not a problem, BHC and toxaphene are both used against the boll weevil. In the South, the boll worm comes into the picture, and with it DDT.

Producers of other insecticides aren't at all daunted by the successes of the big three. For instance, chlordane and newer products like aldrin, dieldrin have proved very effective in similar and other applications.

Home and the Range: Though cotton perhaps is the greatest single target for producers of these insecticides, a host of other outlets also catch their eye. Most insecticides find more applications than the one in which they shine. As might be expected, these uses often overlap, leading to keen competition. In the long run, the price is based on doing a a given job for lowest cost.

These myriad applications of insecticides are generally well known. They make life intolerable for flies, grasshoppers, ticks, aphids, mites, and quite a few more obscure, but none-the-less destructive bugs. Formulated as sprays or dusts, they figure prominently around the house, the barn, the field, and the range.

DDT is of course the most familiar here, with perhaps 75% of all DDT output ending up for these purposes. But though it has many useful properties, DDT has some limitations that prevent its use around dairies and around animal forage. It is comparatively slow in knocking out insects, and much less effective than other insecticides against some of the hardier types. E.g., synergized pyrethrin and allethrin are quicker, safer; chlordane is better against roaches.

The use of BHC for some of these insect control jobs has been growing during the past year, but the material has to be in highly purified form. Since the gamma isomer is by far the most insecticidal—and has least odor and mammalian toxicity—the trend in fly sprays has been to lindane, the

* Figures refer to % BHC (gamma content), DDT, and sulfur, respectively in formulas.

99% gamma BHC. Lindane has been gaining for sprays around dairies, for example, where its higher cost is not out of line.

When insecticides are applied to food crops, safety and avoidance of off-taste are probably the most important criteria. Lindane has made much more progress than previous forms of commercial BHC, but lively competition is encountered from methoxychlor, parathion, chlordane, and other contenders. In many cases, though, these products complement each other, find greatest utility—and sales—in combination.

Home and Abroad: With most of the foreseeable domestic demand for these insecticides provided for, it is evident that there will be plenty to be sold abroad. This is especially true for DDT and BHC which were the first synthetics to reach volume production. From their production capacity of 120-125 million pounds, best estimate now is that no more than 85 million pounds will be needed at home this year.

There is little doubt that the export market can absorb 35 million pounds of each. Export licenses have been liberalized by the Office of International Trade, with the approval of the U.S. Department of Agriculture, to permit greater shipments abroad. Most of this will have been shipped before March 1, when the domestic demand starts to mount. But some think that more exports will be permitted after July.

Up for How Long?

This week, it was still too early to tell whether last month's six cent increase in tartaric acid prices would significantly affect its competitive market position.

For uses as an acidifier in food products like jelly, candy, and soft drinks, tartaric and citric acid are interchangeable. The supply of citric hasn't been too great, but capacity more than doubled during 1951. Now with tartaric prices up from 39½¢ per pound to 45½¢, citric (26½¢) has an even better chance of dominating the market.

The increase in the price of tartaric was accompanied by a boost in quotations on its three principal compounds: cream of tartar (potassium acid tartrate), tartar emetic (potassium antimony tartrate) and Rochelle salt (potassium sodium tartrate). But in comparison to the acid, the chance for a change in demand here was not so great.

Cause of It All: Manufacturers

blame the price rise on raw material cost increases. The starting substance for tartaric acid and all its salts is argol*, a crude cream of tartar, a byproduct of wine manufacture. Supplies come primarily from Spain and Sicily.

While argol quotations vary from day to day, they have been averaging near $40 per hundred kilograms (100% basis). In December, the level was about $35. Translated to the English system, equivalent figures are 18¢ and 16¢ per pound. Selling price for U.S. refined cream of tartar is 41¢, up from 35¢. Refiners here, faced with increased labor and overhead costs have thus raised their margin from 19¢ to 23¢.

Imported refined cream of tartar and tartaric acid have been selling a few cents below domestic; hence importers report a strong demand for their supplies.

Domestic manufacturers also report no significant change in sales as yet, though they do admit that this is a normally busy season. When the demand for such products as soft drinks drops off next fall, and no other use takes up the slack, it's not a bad bet that producers will have to cut margins and reduce prices.

* Originally from *Argos*, the Greek word for white; argol, however, is reddish brown in color.

GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
Commanding General, New York Quartermaster, Procurement Agency, 111 East 16th St., New York, N.Y.:			
Feb. 4	52-116Q	44800000 lbs	Salt, minimum 90% sodium chloride crushed
Feb. 14	52-943B	9048000 bars	Soap, ordinary issue, approx 16 oz bars, spec P-S-591A
Navy Purchasing Officer, San Francisco, Calif.:			
Feb. 8	12793-F-Q	135000 lbs	Acid hydrochloric in 13 gallon contractor owned carboys
		180000 lbs	Acid hydrochloric in 5 gallon contractor owned carboys
Armed Services Petroleum, Purchasing Agency, Washington, D.C.:			
Feb. 12	52-34B		Miscellaneous greases lubricant compound & wax
United States, Atomic Energy Commission:			
Feb. 4	151-52-19	54 gal	Tergitol, No. 4, (wetting agent)
		165 gal	Ethylene glycol monobutyl ether, purified
		495 gal	Dibutyl carbitol
		3 gal	Triethanolamine, purified
Commanding Officer, Chemical Corps Procurement Agency, Army Chemical Center, Md.:			
Feb. 11	52-326-C	35600 gal	Xylene (xylol) in accord with spec TT-X-915, grade B, dtd 10 March, 1948, tank car delivery
Headquarters Air Material Command, Dayton, Ohio:			
Feb. 5	52-591B	49926 gal	Ethylene glycol
Commanding Officer—U.S. Naval Air Station, Corpus Christi, Tex.:			
Feb. 4	216-59-52	5120 lbs	Phosphoric acid
Navy Purchasing Office, 111 East 16th St., New York, N.Y.:			
Feb. 14	184-B	47000 lbs	Lime, chlorinated
Feb. 15	248-B	63504 lbs	Sodium bicarbonate
	214-B	3300 ea	Polish, automobile
	152-B	250000 lbs	Compound boiler
Feb. 19	180-B	21000 gal	Duplicating liquid
	207-B	678800 lbs	Soda, caustic lye
	207-B	455000 can	Soda, caustic lye
	186-B	3000 gal	Glycerine, glycerol

GOVERNMENT AWARDS

Item	Supplier	Location
Department of the Army, New York Ordnance District, 180 Varick St., New York 14, N.Y.:		
Barium nitrate class D	Food Machinery & Chem. Corp.	New York, N.Y.
Aviation Supply Office, 700 Robbins Avenue, Philadelphia 11, Pa.:		
Plastics: laminated phenolic sheet	St. Regis Sales Corp., Panelyte Div.	New York, N.Y.
Armed Services, Medical Procurement Agency, 84 Sands St., Brooklyn 1, N.Y.:		
Nitrofurazone ointment, water soluble	Eaton Laboratories, Inc.	Norwich, N.Y.
Dihydrostreptomycin sulfate	Chas. Pfizer & Co.	Brooklyn 1, N.Y.

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CH. E., LLB., 12 years diversified experience Research and Production in the Process Industries. Seeks administrative assistant position. Registered P.E. PW-3087, Chemical Week.

Executive Assistant: BS, MA, married, 32, five years varied technical experience, including three years management and production and two years chemical laboratory work. Good appearance, pleasing personality. Desire live wire position with growth potential. Capable of heavy responsibility. Location immaterial. PW-3186, Chemical Week.

Organic-Biochemist, Ph.D. desires position of leadership in research and development. Sixteen years industrial experience in synthesis of organic intermediates, pigments, dyes, and photographic chemicals. Publications, patents, ACS, AAAS, Sigma Xi, Alpha Chi Sigma. Family. PW-3163, Chemical Week.

Selling Opportunity Wanted

Distributorship Wanted: Old established and adequately financed, with own warehouse and truckage facilities, interested in obtaining distributorship for State of Calif. and adjacent states on basic raw materials and chemical products for the industrial trade. RA-2886, Chemical Week.

EQUIPMENT—used-surplus

For Sale

Autoclave, 1 gal., glass lined, 500# Pr., Direct fired. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

Autoclave, S/S 347, 100 gallon, ½" shell agt'd. Chemical & Process Machinery Corp. 146 Grand St., New York 13, N.Y.

Centrifuge, Sharples S/S Super D Canter, model PN-14. R. Gelb & Sons, Inc., Union, N.J.

Column, Steel Bubblecap, 21" diam., 20 plates 7" Sp. Arthur Proc. Equip. Co., 29 B'way, NYC.

Crusher, American Ring Roll sz 2400; 50 H.P. mtr. First Mach. Corp. 157 Hudson St., NY 13.

Dryer, Buffalo Vacuum 20 shelf; 40"x44" Complete with all accessories. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Dryer, Buflovak Double Drum, 24"x36". R. Gelb & Sons, Inc., Union, N.J.

Dryer, Vacuum shelf, Devine, double door, 17 shelves, pump, condenser, 3. Consolidated Products, 18 Park Row, N.Y. 38. BArclay 7-0600.

Evaporator, F. J. Stokes, S/S jkt'd, & coiled 54" diameter, 625 gallon. Chemical & Process Machinery Corp. 146 Grand St., New York 13, N.Y.

Dryers 1-11'6"x35' Roto-Louvre. Brill Equipment Co., 2401 Third Avenue, New York 51, N.Y.

Filter, 8'x12', Feinc all S/S Rotary Vacuum, Consolidated Prods., 18 Park Row, N.Y. 38.

Filter, Sweetland #5, 29 leaves. Perry Equip. 1415 N. 6th St., Phila. 22, Pa.

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For Sale

Filters 2-#7 Sweetland, 27 leaves. Brill Equipment. Co., 2401 Third Ave., New York 51.

Filter Press, 30"x30", aluminum, 45 chambers, Consolidated Products, 18 Park Row, N.Y. 38.

Filter Press, 30"x30", iron, Shriver and Johnson, 35-40 chambers, 6. Consolidated Products, 18 Park Row, N. Y. 38 BArclay 7-0600.

Filter Press, Shriver 36"x36", C.I. P/F, 24 Chamb. R. Gelb & Sons, Inc., Union, N.J.

Filter Press, Shriver 42"x42", Evedur P/F, 40 Chamb. R. Gelb & Sons, Inc., Union, N.J.

Filter Presses, all sizes and types. Process Industries, 305 Powell St., Brooklyn 12, N.Y.

Kettle, 2500 gal. ASME steel, closed, jkt'd. agt'd. Chemical & Process Machinery Corp., 146 Grand St., New York 13.

Kettle, Steel, Jktd., 1500 gal. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

Mixer, J. H. Day S/S, D-10, 1000 lb. jkt'd 10 HP motor. Chemical & Process Mchy. Corp., 146 Grand St., New York 13, New York.

Mixer, 600# Day Spiral S.S. lined, Porc. Bottom, M.D. Mach. Ex., 131 Thompson St., N.Y.C.

Mixer. 7000#, Dry Powder, horiz. jack. 12'x5' x5', spiral agitator. Consolidated Products, 18 Park Row, N.Y. 38. BArclay 7-0600.

Mixers, AMF, Glen, 340 qt. & 120 qt., S/S bowls & beaters, AC motors, 4. Consolidated Products, 18 Park Row, N.Y. 38. BArclay 7-0600.

Pebble Mills; 8'x8', Porcelain lined with 50 HP gear motor. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Pulverizers; Mikro #2 & 4; also Raymond No. "00". Robinson No. 4 Hammermill with 60 HP. First Machinery Corp., 157 Hudson St., N.Y. 13.

Pulverizer, 1-3-Roll Raymond High Side Roller Mill, oil journals, all accessories. Brill Equipment Co., 2401 Third Ave., New York 51.

Reactor, Steel 5000 Gal. Jkt'd & Agt'd. 15 HP. Equipment Clearing House, Inc., 289—10 St., B'klyn, NY.

Sifter, No. 71, Day Roball, all S/S, 40"x48", 4, Consolidated Prods., 18 Park Row, N.Y. 38.

Still, 500 Gal., Steel, Vac. & Agit., Jktd., 125#. Arthur Process Equip. Co., 29 B'way, N.Y.C.

Tablet Press, Stokes R, single punch, Consolidated Products, 18 Park Row, N.Y. 38.

Tablet Machine, Stokes Rotary R.D.-4 & B.B.-2. R. Gelb & Sons, Inc., Union, N.J.

Tank, Copper, 11,000 gal., ADME 30# Hydr. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

Tank, 5700 gal., S/S, Horiz., New. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

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Fittings

20-p. catalog covers corrosion-resistant fittings of various types and sizes and describes main features of fittings which are now available in several stainless analyses. Horace T. Potts Co., Erie Ave. and D St., Philadelphia, Pa.

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4-p. illustrated bulletin dealing with the construction and operation of rotary disc continuous blow-off valve, with 15 orifices, designed to maintain uniform boiler water concentrations and prevent steam carry-over. Uniblow Valve Co.

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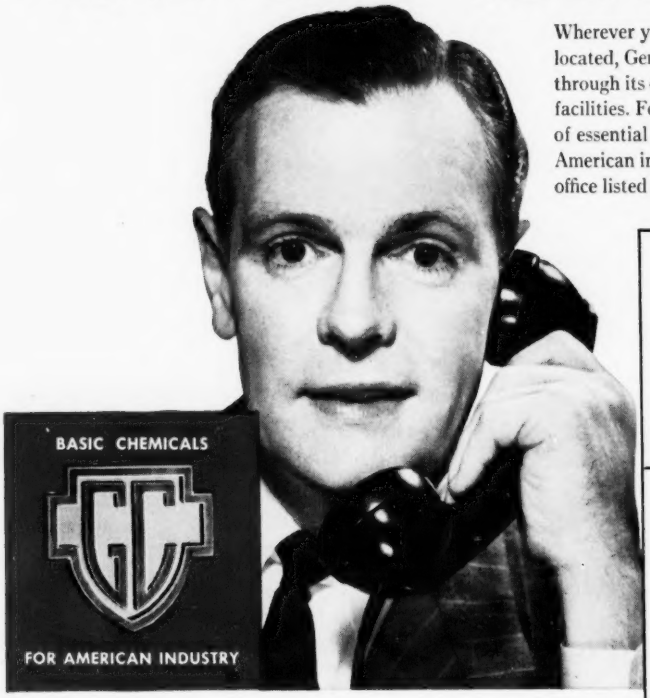

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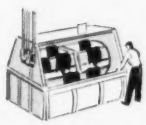

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